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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

December 2001

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees). :Sea surface temperature (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:NGE	:Number of observations with gross errors.
:PGE	:Percentage of observations with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT

:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
AVOSTEST	ALL	P	SUR	25	25	100			
CGDS	ALL	P	SUR	150	1	1	6.1	5.0	7.9
CYLX	ALL	P	SUR	20	9	45	0.8	-13.8	13.8
C6LU3	ALL	P	SUR	46	0	0	1.4	6.4	6.5
C6PZ3	ALL	P	SUR	53	0	0	1.5	-4.0	4.2
C6QK	ALL	P	SUR	21	0	0	2.4	5.7	6.1
ELRR2	ALL	P	SUR	21	0	0	1.1	-4.4	4.5
ELYP8	ALL	P	SUR	53	0	0	2.5	-4.0	4.7
JJKV	ALL	P	SUR	24	0	0	0.9	-4.7	4.7
KS004	ALL	P	SUR	49	2	4	0.9	5.3	5.4
LAOW5	ALL	P	SUR	47	17	36	4.7	12.9	13.7
MVLA7	ALL	P	SUR	74	1	1	3.0	8.5	9.0
OUSE6	ALL	P	SUR	27	0	0	1.4	-5.2	5.4
P3YR5	ALL	P	SUR	33	0	0	1.2	6.6	6.8
P3YS5	ALL	P	SUR	83	0	0	1.3	4.2	4.4
UANF	ALL	P	SUR	21	0	0	3.1	-5.3	6.2
UASX	ALL	P	SUR	21	6	29	6.4	-1.4	6.5
UCAC	ALL	P	SUR	22	0	0	0.8	9.1	9.2
UCJI	ALL	P	SUR	44	4	9	2.8	-8.5	9.0
UCJL	ALL	P	SUR	35	0	0	1.2	6.5	6.6
UHLE	ALL	P	SUR	33	0	0	2.3	-10.2	10.4
VCJM	ALL	P	SUR	34	34	100			
VGDX	ALL	P	SUR	61	0	0	1.0	-4.5	4.6
VRVI2	ALL	P	SUR	20	0	0	0.7	6.2	6.3
VTCN	ALL	P	SUR	21	0	0	2.6	-6.2	6.7
V7BW9	ALL	P	SUR	51	0	0	1.2	-4.5	4.7
4XGV	ALL	P	SUR	29	0	0	3.7	4.7	6.0
62151	ALL	P	SUR	24	0	0	2.9	6.3	6.9
WIND SPEED									
DEHY	ALL	SPEED	SUR	37	11	30	3.2	3.9	5.1
ELTF6	ALL	SPEED	SUR	52	1	2	3.3	5.3	6.3
LAHE2	ALL	SPEED	SUR	38	0	0	3.2	6.5	7.2
MWBJ9	ALL	SPEED	SUR	42	0	0	6.2	5.2	8.1
OWRN2	ALL	SPEED	SUR	29	1	3	5.0	7.7	9.2
UBXS	ALL	SPEED	SUR	27	0	0	3.8	5.9	7.0
VOCJ	ALL	SPEED	SUR	73	7	10	5.2	7.6	9.2
VRUN4	ALL	SPEED	SUR	22	1	5	4.7	5.3	7.1
ZCBU8	ALL	SPEED	SUR	29	0	0	3.1	5.5	6.3
3FHN6	ALL	SPEED	SUR	40	1	2	4.5	5.6	7.2
44145	ALL	SPEED	SUR	241	0	0	4.0	5.0	6.4
62147	ALL	SPEED	SUR	21	0	0	3.9	5.4	6.7
9MBK8	ALL	SPEED	SUR	33	2	6	3.6	7.2	8.1
9MBW	ALL	SPEED	SUR	42	2	5	7.5	9.9	12.4
WIND DIRECTION									
BBXX KS0	ALL	DIRN.	SUR	153	21	14	69.9	51.5	86.8
KS004	ALL	DIRN.	SUR	114	30	26	85.7	35.4	92.7
KS012	ALL	DIRN.	SUR	54	1	2	29.7	78.1	83.6
13009	ALL	DIRN.	SUR	50	0	0	57.7	99.8	115.3
32323	ALL	DIRN.	SUR	52	0	0	12.8	54.8	56.2
62131	ALL	DIRN.	SUR	40	0	0	24.0	34.3	41.8
SEA SURFACE TEMPERATURE									
AVOSTEST	ALL	SST	SUR	24	24	100			
C6JD7	ALL	SST	SUR	20	0	0	1.0	3.2	3.3
C6MS4	ALL	SST	SUR	22	1	5	1.3	-4.0	4.2
C6MX4	ALL	SST	SUR	35	0	0	1.3	5.0	5.1
C6QD3	ALL	SST	SUR	43	13	30	1.2	-0.7	1.4

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE									
C6QO9	ALL	SST	SUR	35	0	0	1.4	4.1	4.3
DBBC	ALL	SST	SUR	439	190	43	1.1	0.0	1.1
DBBX	ALL	SST	SUR	665	610	92	0.7	0.6	0.9
DBOE	ALL	SST	SUR	21	0	0	1.6	-3.3	3.7
ELKU8	ALL	SST	SUR	23	0	0	1.4	3.5	3.8
H9GW	ALL	SST	SUR	37	1	3	1.2	4.1	4.2
JADY	ALL	SST	SUR	67	0	0	0.8	4.5	4.6
KCDK	ALL	SST	SUR	28	0	0	2.4	-4.0	4.7
KHRK	ALL	SST	SUR	39	0	0	1.6	3.5	3.9
KS003	ALL	SST	SUR	46	2	4	0.8	-4.5	4.6
LAJY4	ALL	SST	SUR	71	0	0	1.0	3.4	3.5
LAON4	ALL	SST	SUR	63	0	0	1.9	3.4	3.9
MVLA7	ALL	SST	SUR	65	8	12	1.9	-4.6	5.0
OUJV2	ALL	SST	SUR	153	1	1	0.7	-3.0	3.1
OVRY2	ALL	SST	SUR	20	1	5	0.6	3.0	3.1
PGHT	ALL	SST	SUR	26	0	0	1.8	-3.0	3.5
PJOX	ALL	SST	SUR	71	0	0	1.1	-3.3	3.5
P3ZY6	ALL	SST	SUR	27	0	0	0.9	-4.4	4.4
TSMS	ALL	SST	SUR	42	1	2	1.9	-5.5	5.9
UCMV	ALL	SST	SUR	21	1	5	3.2	-5.9	6.7
VGLZ	ALL	SST	SUR	42	42	100			
WGLA	ALL	SST	SUR	40	5	13	2.1	-7.1	7.4
WZJD	ALL	SST	SUR	33	0	0	0.9	-3.0	3.2
YJQA8	ALL	SST	SUR	43	4	9	3.5	4.0	5.3
ZCBV6	ALL	SST	SUR	23	0	0	2.1	-3.0	3.6
ZNUB9	ALL	SST	SUR	29	2	7	0.7	-4.2	4.3
ZQAY4	ALL	SST	SUR	29	1	3	0.6	-4.2	4.3
46131	ALL	SST	SUR	668	668	100			
46146	ALL	SST	SUR	668	668	100			
46181	ALL	SST	SUR	668	668	100			

Figure 1. SHIP/SYNOP mean daily count. DECEMBER 2001

Main hours only

Global average number of observations in 24 hours = 21172

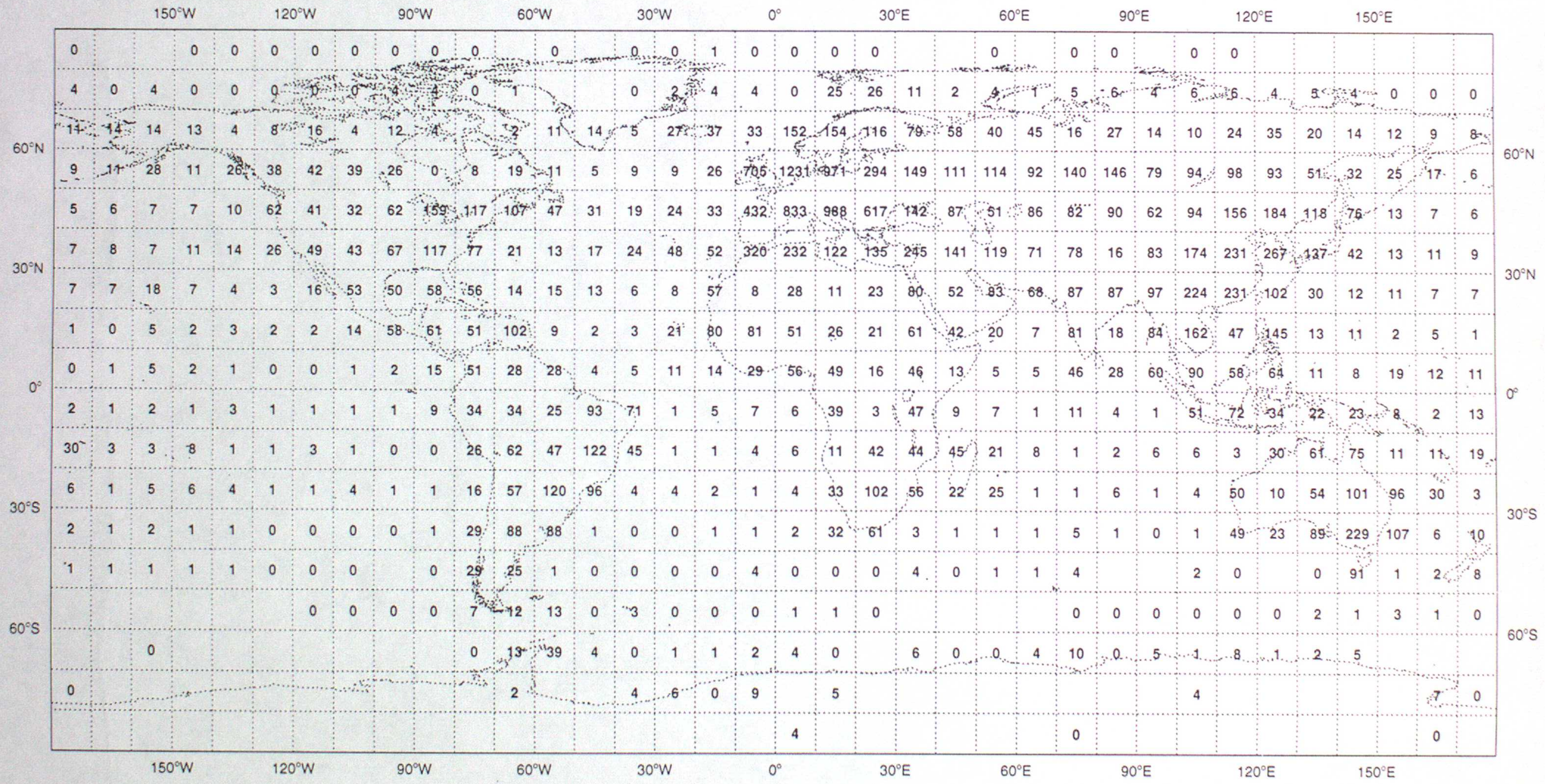


TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoys.
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
	:25 m s^{-1}	(vector wind)
	:10 degrees	(sea surface temperature)

SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
25541	81.7	111.7	ALL	P	SUR	717	237	33	5.8	-2.9	6.5
25551	87.5	-17.0	ALL	P	SUR	486	370	76	6.3	-4.3	7.6
WIND SPEED											
52522	31.4	-169.0	ALL	SPEED	SUR	206	0	0	2.1	-5.2	5.6
52525	15.3	137.0	ALL	SPEED	SUR	32	0	0	2.9	-6.9	7.5
52526	12.7	133.1	ALL	SPEED	SUR	52	0	0	6.6	7.1	9.7
52537	17.5	148.0	ALL	SPEED	SUR	591	0	0	3.9	-5.4	6.7
SEA SURFACE TEMPERATURE											
22511	18.6	113.4	ALL	SST	SUR	252	0	0	0.3	4.8	4.8
22512	36.4	145.3	ALL	SST	SUR	269	0	0	1.8	4.0	4.4
22513	27.8	127.7	ALL	SST	SUR	189	0	0	1.1	4.2	4.4
22514	34.3	140.6	ALL	SST	SUR	129	0	0	1.4	3.2	3.5
33502	-28.1	-23.7	ALL	SST	SUR	103	0	0	0.6	4.9	4.9
41664	41.6	-51.6	ALL	SST	SUR	343	0	0	2.9	4.2	5.1
46972	25.1	-126.1	ALL	SST	SUR	187	0	0	0.3	3.2	3.2
51528	-15.0	167.3	ALL	SST	SUR	150	98	65	3.2	-2.5	4.1
55912	-39.4	171.5	ALL	SST	SUR	637	2	0	1.2	3.3	3.5
61658	44.4	30.6	ALL	SST	SUR	176	0	0	0.9	4.4	4.5

Figure 2. DRIFTER mean daily count. DECEMBER 2001
Main hours only
Global average number of observations in 24 hours = 9418

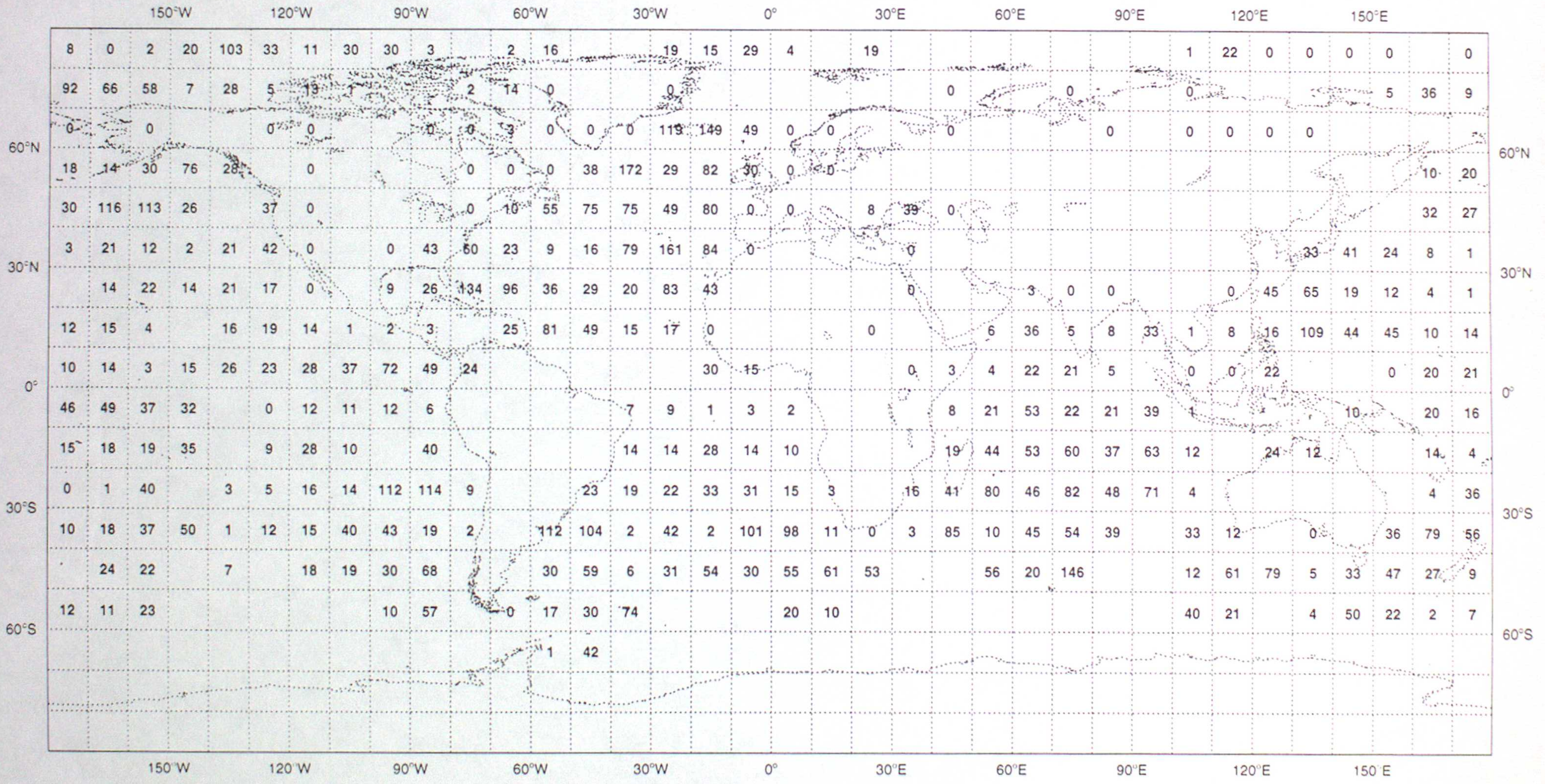


TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60437	36.3N	2.8E	981	S8	87	2	2	3	0.9	-7.6	7.7
60476	35.4N	7.2E	1116	S8	89	49	55	0	0.7	14.1	14.1
60728	36.4N	10.7E	1	MS	56	0	0	0	0.8	-9.0	9.0
62790	12.1N	24.9E	674	MS	78	1	1	0	1.5	4.4	4.6
63150	10.0N	43.2E	1454	M	20	0	0	100	1.6	8.4	8.6
63170	9.5N	44.1E	1326	M	22	1	5	5	1.7	7.6	7.8
63333	11.1N	39.7E	1903	MS	47	2	4	2	0.7	5.6	5.6
63334	10.3N	37.7E	2515	MS	44	0	0	0	0.8	10.3	10.3
63402	7.7N	36.8E	1725	S	39	1	3	3	1.1	7.9	8.0
63450	9.0N	38.8E	2354	MS	43	0	0	0	0.9	4.0	4.1
63471	9.6N	41.9E	1260	MS	45	0	0	2	1.6	10.6	10.7
63478	5.9N	43.6E	295	MS	39	0	0	0	0.7	5.6	5.6
63680	0.3N	32.6E	1144	S	23	0	0	4	2.1	-7.1	7.4
63801	4.9S	29.6E	882	S8	34	1	3	0	0.8	8.3	8.3
65355	9.8N	1.1E	342	MS	115	2	2	1	2.4	-12.2	12.4
67250	15.6S	32.8E	882	S8	38	37	97	0	0.0	1.4	1.4
68030	18.5S	25.6E	1071	8	82	0	0	1	1.3	4.6	4.8
68038	20.5S	26.0E	903	8	85	0	0	0	1.3	4.2	4.4
68106	23.6S	15.1E	407	M	31	14	45	0	2.9	-0.8	3.0
68396	26.5S	31.3E	641	S8	59	0	0	0	1.0	5.2	5.3
68575	30.0S	30.0E	1175	S8	91	91	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	MS	114	15	13	28	4.0	7.7	8.7
24688	63.3N	143.2E	741	MS	124	47	38	27	4.2	5.0	6.5
30253	57.9N	114.2E	275	MS	124	2	2	15	3.9	4.5	6.0
30554	54.5N	113.6E	995	MS	124	0	0	0	4.2	5.9	7.2
30967	49.9N	115.8E	623	MS	90	1	1	1	2.3	-7.8	8.1
31123	57.8N	130.9E	255	MS	124	1	1	0	3.4	5.0	6.0
36058	51.4N	86.0E	420	MS	122	0	0	26	2.5	4.3	5.0
36096	51.7N	94.5E	628	M	123	24	20	34	4.2	7.8	8.9
36864	43.5N	75.3E	743	M	124	1	1	19	3.2	5.0	5.9
40700	39.6N	48.1E	45	MS	106	0	0	1	1.6	-4.0	4.3
40726	36.8N	45.7E	1384	MS	104	0	0	0	1.1	4.0	4.1
40741	36.6N	61.2E	235	MS	108	0	0	0	1.3	-4.9	5.1
40757	35.6N	53.4E	1171	MS	103	0	0	4	2.1	5.8	6.2
41254	23.1N	57.7E	1755	S8	48	48	100	0			
41396	16.0N	48.9E	700	MS	31	0	0	0	1.0	6.8	6.9
41466	13.7N	44.1E	1402	8	31	0	0	0	0.6	-5.8	5.8
44212	50.0N	92.1E	940	MS	119	3	3	24	3.9	4.0	5.6
44265	46.1N	91.5E	1186	MS	119	2	2	1	1.4	4.5	4.7
44416	28.6N	81.6E	720	MS	84	2	2	1	2.3	4.7	5.2
47022	40.8N	128.2E	1200	S	85	1	1	1	0.9	5.2	5.3
47127	36.9N	127.0E	16	MS	124	0	0	2	0.8	-12.3	12.3
48381	16.4N	102.8E	165	MS	122	0	0	0	0.8	-4.0	4.1
51053	48.1N	86.4E	534	M	117	0	0	15	1.4	4.1	4.3
51334	44.6N	82.9E	321	M	116	12	10	91	3.1	8.0	8.6
51379	44.0N	89.6E	794	M	117	3	3	59	3.2	8.0	8.6
51495	43.5N	91.6E	874	M	116	48	41	56	2.7	11.0	11.3
51818	37.6N	78.3E	1376	M	117	0	0	57	3.0	6.7	7.3
52378	41.4N	102.4E	960	M	117	0	0	34	1.9	5.8	6.1
52602	38.8N	93.4E	2734	S	124	0	0	0	1.5	-5.7	5.9
52866	36.6N	101.8E	2262	S	124	0	0	0	1.0	-4.3	4.4
52955	35.6N	100.8E	3201	S	124	2	2	0	0.9	12.8	12.8
53083	44.6N	114.2E	1183	M	117	0	0	62	2.5	4.6	5.2
53352	41.7N	110.4E	1377	M	117	3	3	59	3.0	6.4	7.1
53480	41.0N	113.1E	1416	M	119	0	0	40	2.4	5.5	6.0
53487	40.1N	113.3E	1069	M	117	0	0	29	2.4	5.4	5.9

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
53502	39.8N	105.8E	1033	M	117	0	0	56	2.2	4.9	5.4
53593	39.8N	114.6E	910	M	117	0	0	74	1.9	5.8	6.1
53673	38.8N	112.7E	838	M	118	0	0	14	1.9	4.2	4.6
53705	37.5N	105.7E	1185	M	117	0	0	21	1.9	4.6	5.0
53764	37.5N	111.1E	951	M	117	0	0	6	2.0	4.1	4.6
54308	41.2N	116.6E	661	M	117	0	0	3	1.7	4.4	4.7
54311	41.9N	117.8E	844	M	117	0	0	3	1.9	4.0	4.4
54386	41.4N	128.2E	1018	M	117	0	0	69	2.5	5.3	5.9
54587	39.1N	123.2E	-30	M	115	0	0	1	1.3	-4.3	4.5
56144	31.8N	98.6E	3184	S	124	0	0	1	1.2	-5.2	5.3
56146	31.6N	100.0E	339	S	124	124	100	0			
56287	30.0N	103.0E	629	M	124	0	0	1	1.6	4.0	4.3
56385	29.5N	103.3E	3049	S	124	0	0	30	3.0	-6.6	7.2
56444	28.5N	98.9E	3488	S	124	6	5	0	0.6	14.0	14.0
56462	29.0N	101.5E	2994	S	124	0	0	1	1.8	9.3	9.5
57006	34.6N	105.8E	1143	M	116	0	0	0	1.7	5.3	5.6
57016	34.3N	107.1E	610	M	119	0	0	0	2.0	4.6	5.0
57922	25.8N	107.6E	971	M	124	0	0	3	1.9	4.0	4.4
59007	24.1N	105.1E	1251	M	124	0	0	29	2.0	4.2	4.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	43	0	0	2	1.4	-5.4	5.6
80342	1.4N	77.3W	1796	S	53	1	2	0	0.6	4.0	4.0
82181	2.0S	54.1W	146	MS	85	0	0	0	1.4	5.4	5.6
82704	7.6S	72.7W	170	MS	75	0	0	3	2.1	-4.3	4.8
82765	7.3S	47.5W	193	MS	81	0	0	0	0.9	4.5	4.6
83235	12.4S	46.4W	604	MS	82	0	0	1	1.1	7.2	7.3
83319	14.7S	52.4W	315	MS	79	0	0	0	1.2	4.9	5.0
83332	14.1S	46.4W	826	MS	83	38	46	0	0.9	13.7	13.7
83408	14.3S	43.8W	447	MS	84	0	0	0	0.8	12.0	12.0
83488	17.8S	42.9W	1097	MS	83	83	100	0			
83531	18.6S	46.5W	940	MS	83	0	0	1	0.9	-6.7	6.8
83587	19.9S	43.9W	850	MS	82	0	0	1	1.1	-7.3	7.4
83773	23.1S	48.9W	793	MS	83	1	1	0	1.0	-4.2	4.3
83836	25.5S	50.6W	837	MS	85	0	0	0	0.8	-5.0	5.1
83953	30.9S	55.5W	231	MS	85	2	2	1	1.4	-10.3	10.4
84425	5.9S	76.1W	179	MS	22	0	0	5	2.0	5.2	5.6
84455	6.5S	76.4W	281	MS	78	0	0	0	1.4	7.4	7.5
84472	7.1S	78.5W	2620	S	51	0	0	0	0.9	-5.4	5.5
84474	7.2S	76.7W	350	S	22	1	5	0	1.4	11.4	11.5
84686	13.6S	72.0W	3248	S	108	0	0	1	1.3	-4.2	4.4
84688	13.7S	73.4W	3444	S	43	0	0	0	0.7	-12.9	12.9
84720	14.9S	75.0W	567	MS	52	0	0	0	1.1	5.0	5.1
84782	18.1S	70.3W	468	MS	88	0	0	0	1.2	7.8	7.9
85140	14.3S	67.4W	140	MS	58	1	2	0	1.7	5.6	5.9
85141	14.5S	67.6W	204	MS	57	0	0	0	1.9	4.4	4.8
85210	16.3S	58.4W	124	MS	59	4	7	0	1.5	6.6	6.8
85264	18.5S	64.1W	1998	S	56	56	100	0			
85312	19.8S	63.9W	992	S	45	0	0	0	1.0	-9.6	9.7
85406	18.3S	70.3W	55	M	120	0	0	0	0.9	4.3	4.4
85432	22.5S	68.9W	2320	S8	81	0	0	1	1.3	5.5	5.7

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71021	61.3N	124.5W	283	S	120	0	0	55	2.4	4.8	5.4
71023	65.9N	89.5W	18	MS	124	124	100	0			
71048	61.6N	125.8W	610	S	122	0	0	15	1.9	7.6	7.8
71506	66.9N	136.3W	720	MS	123	0	0	2	1.5	-4.3	4.6
71747	48.8N	91.6W	424	MS	124	0	0	0	0.7	4.0	4.1
76118	30.4N	109.7W	1040	MS	24	0	0	4	2.0	-10.4	10.6
76243	28.7N	100.5W	250	MS	78	1	1	3	1.7	4.8	5.1
76491	23.8N	99.1W	355	MS	91	0	0	0	1.1	4.1	4.2
76543	22.0N	98.8W	104	MS	27	0	0	52	1.2	8.4	8.5
76625	20.6N	100.4W	1813	MS	47	0	0	66	1.0	-7.9	8.0
76658	19.2N	103.7W	494	MS	23	0	0	0	1.0	5.3	5.4
76683	19.3N	98.2W	2248	MS	89	0	0	0	0.8	4.1	4.2
76743	18.0N	92.9W	10	MS	66	0	0	2	1.5	5.9	6.1
76773	17.8N	97.8W	1650	MS	26	0	0	0	0.7	4.3	4.4
76855	15.7N	96.5W	43	MS	59	0	0	24	1.0	-4.1	4.2
76903	14.9N	92.3W	118	MS	100	0	0	1	1.5	6.1	6.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94130	14.8S	131.9E	120	MS	82	0	0	0	0.8	5.8	5.9
94215	15.4S	126.3E	400	MS	23	4	17	57	2.1	-11.7	11.9
95815	35.1S	144.0E	72	MS	124	0	0	0	2.3	6.9	7.3
97378	10.7S	123.1E	1	MS	37	37	100	0			

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01280	64.3N	11.2E	86	MS	91	0	0	1	1.4	-4.1	4.3
04416	72.6N	38.4W	3202	S	100	1	1	1	1.4	-4.1	4.3
06605	47.1N	7.1E	1599	S8	124	0	0	29	2.0	-5.8	6.1
06685	47.0N	9.1E	515	MS	124	0	0	2	1.3	7.8	7.9
06716	46.2N	7.3E	737	S8	123	0	0	8	1.5	4.1	4.4
10557	50.5N	11.1E	845	S8	372	372	100	0			
11116	47.5N	10.8E	870	MS	62	0	0	2	1.1	4.6	4.7
12140	54.4N	18.7E	2	MS	122	0	0	0	0.7	7.9	7.9
13269	44.3N	19.9E	176	MS	118	0	0	0	1.2	9.2	9.3
14554	44.9N	18.4E	140	S	62	9	15	3	1.0	-13.2	13.2
14650	43.8N	18.0E	972	S	61	2	3	0	1.0	4.6	4.7
15088	46.1N	25.3E	2022	S8	38	1	3	16	1.6	-4.2	4.5
15284	45.6N	26.4E	1632	S8	40	0	0	0	2.2	4.0	4.6
17092	39.8N	39.5E	1218	S8	124	0	0	0	1.6	8.6	8.7
17203	38.9N	40.5E	1177	S8	124	0	0	0	1.3	9.0	9.1

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89263	66.0S	66.1W	20	M	247	0	0	0	1.1	9.7	9.8
89264	71.4S	68.9W	780	S	206	1	0	0	1.0	8.7	8.8
89266	72.2S	60.3W	91	S	259	231	89	0	0.4	-14.4	14.4
89272	74.8S	71.5W	1369	S	267	267	100	0			
89327	73.2S	127.1W	230	S	254	63	25	8	3.4	2.0	3.9
89612	66.3S	110.8E	390	S	267	267	100	0			
89637	69.9S	130.0E	2560	S	319	21	7	0	0.8	13.5	13.5
89661	73.1S	169.6E	200	S	88	1	1	0	2.6	7.3	7.7
89666	76.7S	163.0E	200	S	77	77	100	0			
89744	74.0S	43.0E	3353	S	275	0	0	0	0.6	7.1	7.1
89769	78.5S	168.4E	50	S	397	397	100	0			
89847	67.6S	146.0E	30	S	315	0	0	0	1.1	-7.7	7.8

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	1993	0	42	1.5	0.3	1965	0	43	0	7.9	1.1
AAL	6403	1	33	1.7	0.0	6376	0	32	0	7.6	0.7
AAR	1178	1	6	2.0	-0.7	1172	1	7	0	7.9	0.4
ACA	3363	0	10	1.7	-0.1	3365	0	11	0	8.1	0.7
ACI	51	0	47	0.9	0.1	51	0	47	0	6.8	1.2
AEA	923	1	3	1.8	0.5	915	0	3	0	7.4	0.7
AEL	620	0	9	1.6	-0.5	612	0	10	0	8.0	0.3
AEY	187	2	5	2.1	1.0	187	0	4	0	8.3	1.1
AFL	649	0	3	1.8	0.5	650	0	4	0	7.9	0.4
AFR	1948	1	6	1.8	0.4	1959	0	6	0	7.4	0.6
AIH	368	1	5	1.8	0.1	362	0	5	0	7.9	1.3
AJM	216	0	2	1.4	-0.1	211	0	2	0	6.6	1.6
AMM	90	0	8	1.3	0.1	91	0	13	0	11.7	1.3
AMT	731	1	44	2.6	1.7	732	0	43	0	8.3	0.4
AMX	406	2	5	1.7	0.0	404	0	4	0	9.2	0.7
ANA	605	0	11	1.5	0.6	610	0	12	0	7.2	0.6
ANZ	5579	0	32	1.5	0.3	5565	0	32	0	6.8	0.9
AVA	285	1	4	1.8	0.7	282	0	5	0	8.9	0.6
AVE	508	2	6	1.9	1.0	508	0	8	0	11.3	1.1
AVN	122	0	46	0.9	-0.1	123	0	46	0	6.0	-0.3
AZA	599	1	56	2.2	0.6	590	0	4	0	8.9	0.5
BAL	286	0	7	1.2	-0.1	285	0	9	0	8.0	0.8
BAW	773	1	7	1.8	-0.4	778	0	7	0	7.0	0.5
BLX	52	0	0	1.1	-0.1	52	0	2	0	8.2	0.4
BSK	22	14	23	2.0	0.1	21	0	10	0	11.3	-0.8
BWA	332	1	7	2.3	1.7	334	1	8	0	10.1	0.4
CAL	141	1	4	1.8	0.4	144	1	7	0	7.8	-0.1
CCA	288	2	21	2.9	0.7	329	1	100	0	14.3	-0.5
CES	410	1	9	2.0	0.4	424	0	11	0	11.0	-0.5
CFC	61	0	13	2.4	0.1	62	0	18	0	8.0	1.6
CFG	1129	1	4	1.4	-0.6	1120	0	5	0	7.3	0.3
CKS	182	1	43	1.9	0.6	181	1	43	0	7.4	0.9
CLX	480	0	5	1.7	-0.7	484	0	5	0	6.5	0.3
CMI	46	0	20	1.5	-0.7	46	0	22	0	7.5	1.1
COA	881	1	40	1.4	-0.2	881	0	40	0	7.0	0.7
CRL	720	1	6	1.7	0.6	720	0	6	0	7.9	0.7
CSN	99	0	5	2.0	0.4	99	0	6	0	8.2	1.7
CUB	313	1	4	1.9	1.3	311	0	5	0	9.1	0.1
DAL	2895	0	40	1.6	-0.2	2918	0	41	0	7.0	0.5
DCE	187	0	7	1.6	0.6	188	1	9	0	8.0	0.1
DHL	22	9	100	7.1	-7.1	22	0	45	0	11.4	0.6
DLH	1582	0	12	1.4	0.1	1567	0	13	0	6.5	0.7
EDW	111	0	5	1.6	0.0	110	1	7	0	8.2	0.8
EEZ	98	1	6	1.6	0.8	94	0	6	0	8.7	0.7
EIA	301	1	23	2.1	-0.7	296	0	100	0	14.3	3.6
ELY	84	1	4	1.2	-0.2	86	0	5	0	6.8	1.1
ETH	29	3	7	1.0	0.0	28	0	4	0	6.3	1.9
EVA	249	0	13	1.7	-0.2	248	1	15	0	7.8	0.1
EWW	65	0	5	1.1	0.0	69	0	6	0	6.4	0.4
FDX	1633	1	44	1.6	0.4	1656	0	44	0	7.9	0.4
FIN	299	0	3	1.6	0.0	296	0	5	0	8.2	1.0
FJI	846	0	46	1.3	0.3	821	0	47	0	6.6	1.0
FOM	671	1	33	1.5	0.2	673	0	33	0	7.7	1.0
GCO	132	2	17	1.4	0.2	134	0	100	0	12.5	0.0
GHA	96	0	5	1.6	-0.4	97	0	11	0	14.4	1.5
GOS	29	0	41	2.2	-0.2	29	0	45	0	8.1	-1.5
GRL	33	0	0	1.0	-0.2	33	0	0	0	5.4	-0.9
GTI	493	0	18	1.8	-0.1	493	0	18	0	7.3	0.9
HAL	4032	0	39	1.6	0.1	4020	0	40	0	9.5	1.6

IDENT.		TEMPERATURE					WIND				
	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
IBE	3244	1	6	1.9	0.4	3201	0	6	0	7.7	0.8
ICE	782	0	3	1.6	-0.2	773	0	4	0	7.3	0.7
IWD	151	1	7	1.5	-0.7	153	0	9	0	9.6	0.2
JAA	67	0	6	2.0	1.4	67	0	7	0	7.5	1.9
JAL	3003	0	5	1.7	0.1	3008	0	5	0	7.6	0.4
JAZ	1020	0	5	1.8	0.9	1024	1	7	0	8.1	1.0
JKK	213	1	3	1.4	-0.2	184	0	7	0	9.3	1.0
JMC	77	1	6	1.7	0.6	74	0	5	0	6.6	0.8
KAL	2845	1	13	1.8	0.1	2870	1	14	0	8.8	0.2
KIW	42	0	52	2.7	1.8	38	11	50	0	8.8	1.5
KLM	2236	0	3	1.5	0.0	2232	0	5	0	7.8	0.6
LAN	81	14	100	3.1	1.4	82	0	100	0	16.1	-1.5
LAP	79	5	47	3.0	1.8	81	0	44	0	9.1	1.1
LDA	136	1	7	1.4	0.0	137	1	8	0	8.9	1.0
LDI	462	1	100	2.4	0.0	455	0	7	0	8.1	0.8
LIB	1266	2	9	1.6	0.7	1268	0	10	0	8.0	0.6
LOT	108	0	5	2.1	-1.3	106	0	8	0	9.7	0.1
LTU	901	0	5	1.4	-0.2	891	0	6	0	7.3	0.7
MAS	311	1	8	1.8	-0.1	326	0	7	0	7.5	0.0
MON	125	0	4	1.8	-0.1	124	0	3	0	7.2	0.4
MPD	261	0	3	1.5	-0.1	258	0	5	0	9.3	0.7
MPH	788	0	2	1.7	-0.7	782	1	3	0	6.9	0.3
NCA	750	0	3	1.9	0.1	738	1	5	0	8.0	0.3
NWA	9006	0	10	1.7	0.4	9014	0	11	0	8.1	0.4
NZL	2118	0	16	1.4	0.2	2118	0	16	0	6.5	1.3
OAE	158	1	42	1.3	-0.2	154	0	42	0	7.0	1.4
PAC	387	0	27	1.9	-0.6	392	0	27	0	7.8	0.5
PAL	1368	0	13	1.6	-0.2	1292	0	14	0	8.3	0.7
PAO	470	0	55	1.5	0.3	470	0	56	0	8.2	2.1
QFA	4452	0	59	1.5	0.5	4439	0	59	0	6.3	0.7
RAF	20	0	5	2.8	0.9	20	0	0	0	6.4	1.9
RAM	54	2	11	2.3	-0.9	54	0	9	0	8.0	0.7
RCH	458	2	100	2.6	-0.2	460	0	100	0	11.4	2.5
RRR	37	0	8	1.6	-0.2	38	0	11	0	6.7	-1.9
RYN	201	0	43	1.4	0.9	205	0	43	0	6.9	0.9
RZO	247	9	34	4.5	2.0	245	0	7	0	9.9	1.7
SAA	357	1	7	1.5	-0.1	353	0	7	0	7.1	0.5
SHE	20	0	0	1.4	0.5	20	0	0	0	8.9	1.6
SIA	281	0	2	1.4	0.0	286	0	3	0	6.6	1.3
SLR	210	0	11	1.7	0.6	212	0	13	0	8.3	0.8
SQC	37	0	0	1.3	0.6	37	0	0	0	6.5	1.0
SVA	43	0	9	2.3	0.8	46	0	9	0	6.3	0.5
TAG	40	0	20	2.2	-0.6	40	0	18	0	8.6	2.2
TAM	49	2	8	2.1	1.2	49	0	100	0	14.5	5.0
TAP	729	1	5	1.8	-0.1	721	0	6	0	9.1	0.7
THA	197	0	5	1.7	-0.1	196	0	56	0	6.7	0.8
THT	56	4	32	2.1	0.5	56	0	30	0	7.1	0.3
TPA	52	0	2	1.4	0.1	52	0	0	0	5.3	-0.2
TSC	37	0	0	2.0	0.1	35	0	0	0	6.3	1.0
TWA	22	0	45	1.1	0.3	22	0	45	0	4.0	0.6
UAL	152005	0	100	1.4	-0.1	151912	0	100	0	5.5	0.8
UPS	1452	0	49	1.6	0.3	1454	0	49	0	7.5	0.8
USA	222	0	3	1.5	-0.2	185	0	4	0	6.8	1.3
VIR	369	2	4	1.5	-0.2	374	0	4	0	7.8	1.0
VKG	45	0	7	2.2	-0.5	45	0	2	0	4.7	0.5
VPB	37	3	3	1.9	1.0	37	0	0	0	4.7	1.3
VRG	217	1	57	2.6	0.9	218	1	100	0	10.3	1.7
VVR	80	4	38	2.7	0.0	78	0	29	0	8.9	-0.3
WOA	163	2	5	1.6	0.4	177	2	11	0	9.3	1.1
XAS	44	0	34	2.0	-1.0	46	2	33	0	6.4	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	32507	0	11	1.3	0.6	32520	0	11	0	5.3	0.7
EU	90239	0	35	1.3	0.2	90239	0	34	0	4.7	0.4
KL	1525	0	10	1.4	0.9	1515	0	10	0	5.2	0.9
LH	2277	0	7	1.6	1.2	2271	0	7	0	5.3	1.2
MK	4154	0	7	1.7	1.4	4141	0	7	0	7.1	1.8
SA	7970	0	59	2.1	1.6	7958	0	9	0	5.9	0.7
TN	92	0	22	2.2	0.4	93	0	26	0	11.7	1.8
WA	360	2	10	1.8	0.4	357	4	15	0	9.6	1.0
XX	4536	2	9	1.6	0.2	4516	0	10	0	9.8	1.3
N	778	1	29	2.2	0.4	840	0	29	0	8.2	0.5
US ACARS	652076	2	58	1.5	0.4	652070	0	57	0	5.6	1.0

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	511	1	36	1.4	0.0	507	0	36	0	7.6	1.1
ACI	30	0	53	1.2	0.5	30	0	53	0	6.7	4.4
AFR	76	0	7	1.2	0.5	75	0	7	0	5.3	0.3
AMT	35	3	51	3.9	2.3	33	0	42	0	7.6	0.4
ANZ	171	2	27	1.2	0.1	172	0	26	0	6.9	0.4
ATN	37	5	27	2.3	-0.7	36	0	22	0	10.6	2.2
AVN	24	0	58	2.7	0.0	24	0	50	0	8.1	1.5
AXF	34	6	41	2.5	-0.2	34	0	38	0	9.6	0.3
CFC	107	4	5	1.2	0.6	107	0	3	0	7.0	0.7
CIU	28	0	4	1.6	1.3	28	0	11	0	12.4	-0.9
CLX	21	10	10	1.3	-0.2	20	0	5	0	5.7	0.0
COA	56	0	59	2.1	0.2	56	0	57	0	9.5	1.1
CRL	34	3	3	1.2	0.3	33	0	3	0	9.5	0.2
CUB	33	3	18	2.5	0.8	33	0	12	0	9.5	-1.4
DAL	282	1	51	1.4	0.3	271	0	51	0	7.0	0.9
DHL	66	0	48	6.1	-6.0	63	0	17	0	11.2	0.9
DLH	232	0	13	1.6	0.2	230	0	15	0	10.3	1.0
EIA	23	0	22	1.7	-0.4	23	0	100	0	11.0	1.1
EWW	71	0	1	1.2	0.5	74	0	4	0	7.5	1.2
FDX	633	0	28	1.3	0.5	645	1	32	0	8.8	1.1
FRE	54	6	17	3.8	-0.1	35	0	6	0	9.5	3.3
GCO	268	2	8	1.3	0.2	275	1	100	0	16.8	3.8
GHA	60	0	12	1.5	-0.5	59	0	14	0	11.8	0.7
GTI	25	0	8	2.0	1.0	25	0	8	0	7.6	0.5
HAL	97	2	42	1.2	0.2	97	0	41	0	10.6	2.6
IBE	101	0	22	2.0	-0.9	102	0	22	0	7.9	0.8
ICE	24	0	0	0.9	-0.6	24	0	0	0	4.7	-0.1
JAA	32	0	0	2.0	0.9	32	0	3	0	6.9	-0.2
JAL	58	5	9	1.8	0.5	58	0	3	0	5.8	1.6
JAZ	96	3	15	1.9	1.3	98	0	10	0	7.4	2.4
KAL	67	6	33	2.3	-0.8	68	0	29	0	10.0	3.0
KIW	86	2	31	2.8	1.8	88	0	28	0	8.4	-0.6
KLM	59	0	3	1.6	0.6	59	0	3	0	6.0	0.9
LAN	97	1	100	2.4	0.8	100	0	100	0	8.6	3.1
LIB	49	2	8	2.0	1.0	51	0	4	0	6.2	0.2
LTU	23	0	9	1.3	-0.2	23	0	4	0	6.5	2.1
LXP	21	5	14	3.0	0.7	21	0	5	0	10.3	2.6
MAS	39	0	36	2.2	-0.1	39	0	36	0	9.5	1.1
MPH	45	0	7	1.8	-0.5	45	0	4	0	6.4	0.1
NCA	110	2	3	1.6	0.1	104	0	3	0	6.6	0.9
NWA	207	0	26	2.1	0.2	208	0	25	0	9.3	2.5
NZL	12607	0	59	1.4	0.4	12607	0	59	0	5.2	0.7
PAC	24	4	29	3.4	1.3	24	0	13	0	12.0	0.2
PAL	22	0	0	1.2	-0.9	22	0	5	0	8.1	-0.4
QFA	148	2	54	1.0	0.4	147	0	53	0	6.5	0.1
RCH	141	1	100	4.5	-1.8	137	1	100	0	13.3	2.4
RRR	84	7	20	3.0	2.0	85	0	18	0	13.3	0.3
SAA	53	2	6	1.7	-0.7	52	0	2	0	5.5	-0.8
SIA	60	0	7	1.1	0.3	61	0	7	0	5.0	1.2
SKI	39	23	31	4.3	-2.7	21	5	19	0	13.3	-0.6
UAL	276101	0	100	1.3	0.0	275666	0	100	0	4.9	0.3
UPS	285	0	45	1.4	0.4	277	0	46	0	7.7	0.0
VTA	42	0	21	2.9	-1.3	43	0	30	0	5.2	0.8
VVP	37	0	46	3.3	1.7	41	0	44	0	6.8	-0.1
AU	27284	0	52	1.3	0.3	27319	0	52	0	4.6	0.2
EU	409590	0	70	1.1	0.2	408159	0	70	0	4.1	-0.2
KL	1197	0	55	1.2	0.6	1196	0	55	0	3.8	0.3
LH	1164	0	52	1.2	0.4	1154	0	52	0	4.5	0.5
MK	2733	0	54	1.4	0.8	2711	0	54	0	4.7	1.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SA	6078	0	78	1.8	0.7	6066	0	58	0	5.0	0.9
WA	64	3	11	1.5	0.4	63	3	13	0	10.8	1.8
XX	1299	4	9	1.5	0.1	1295	0	12	0	12.5	1.9
A	20	5	5	2.1	0.3	20	0	5	0	6.6	-0.1
US ACARS	1341123	0	79	1.3	0.3	1335619	0	79	0	4.7	0.1

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 33494

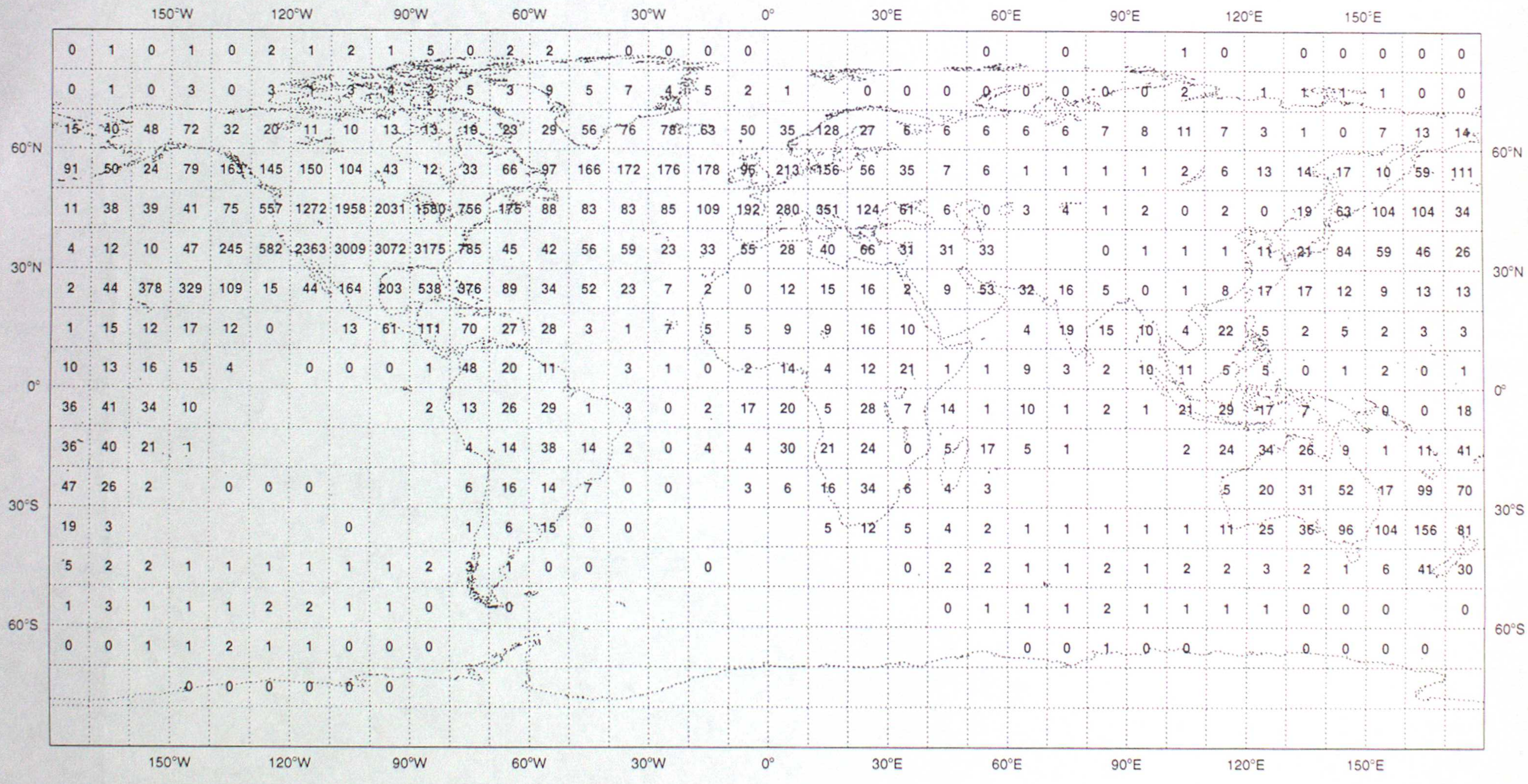


Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 66997

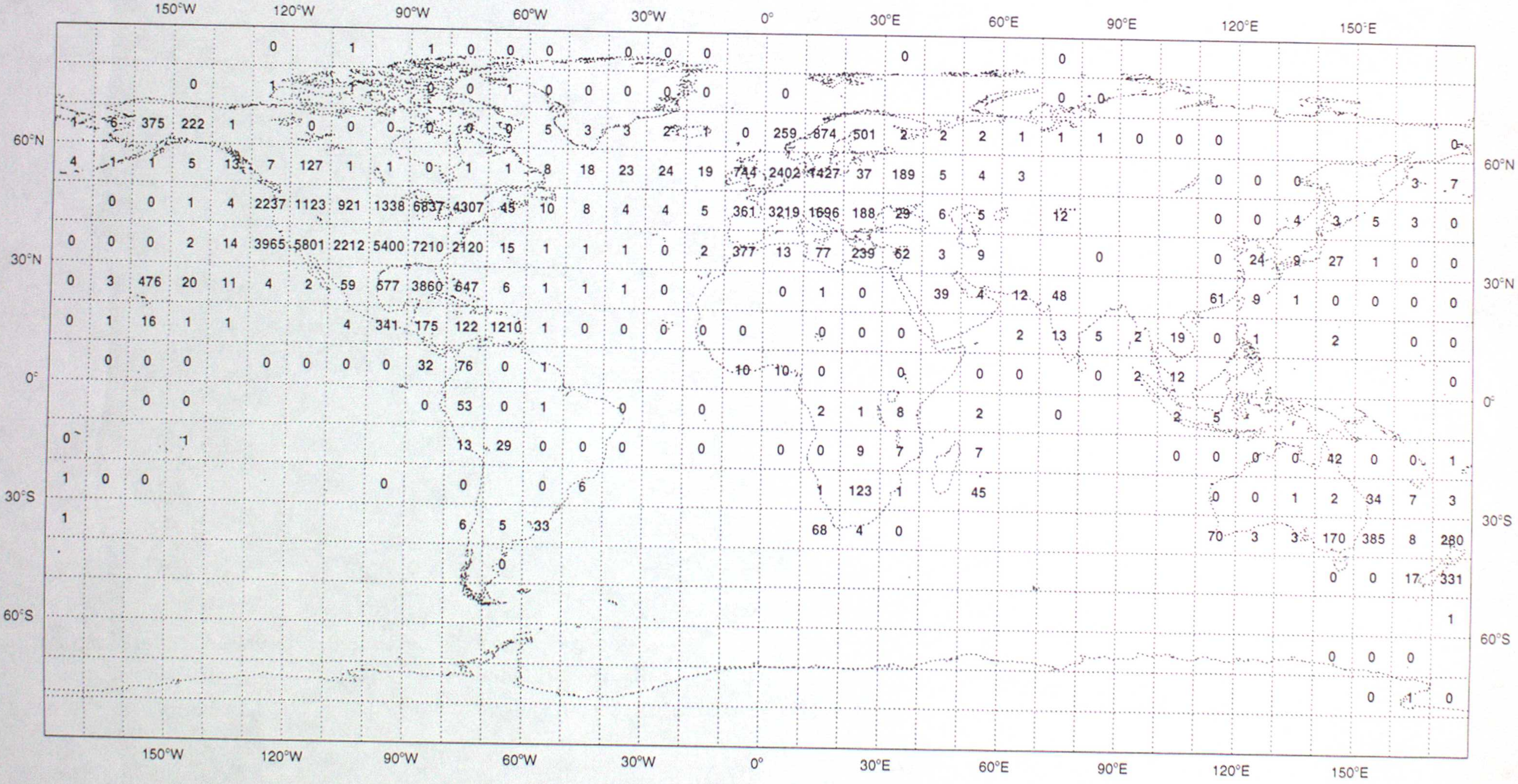


Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

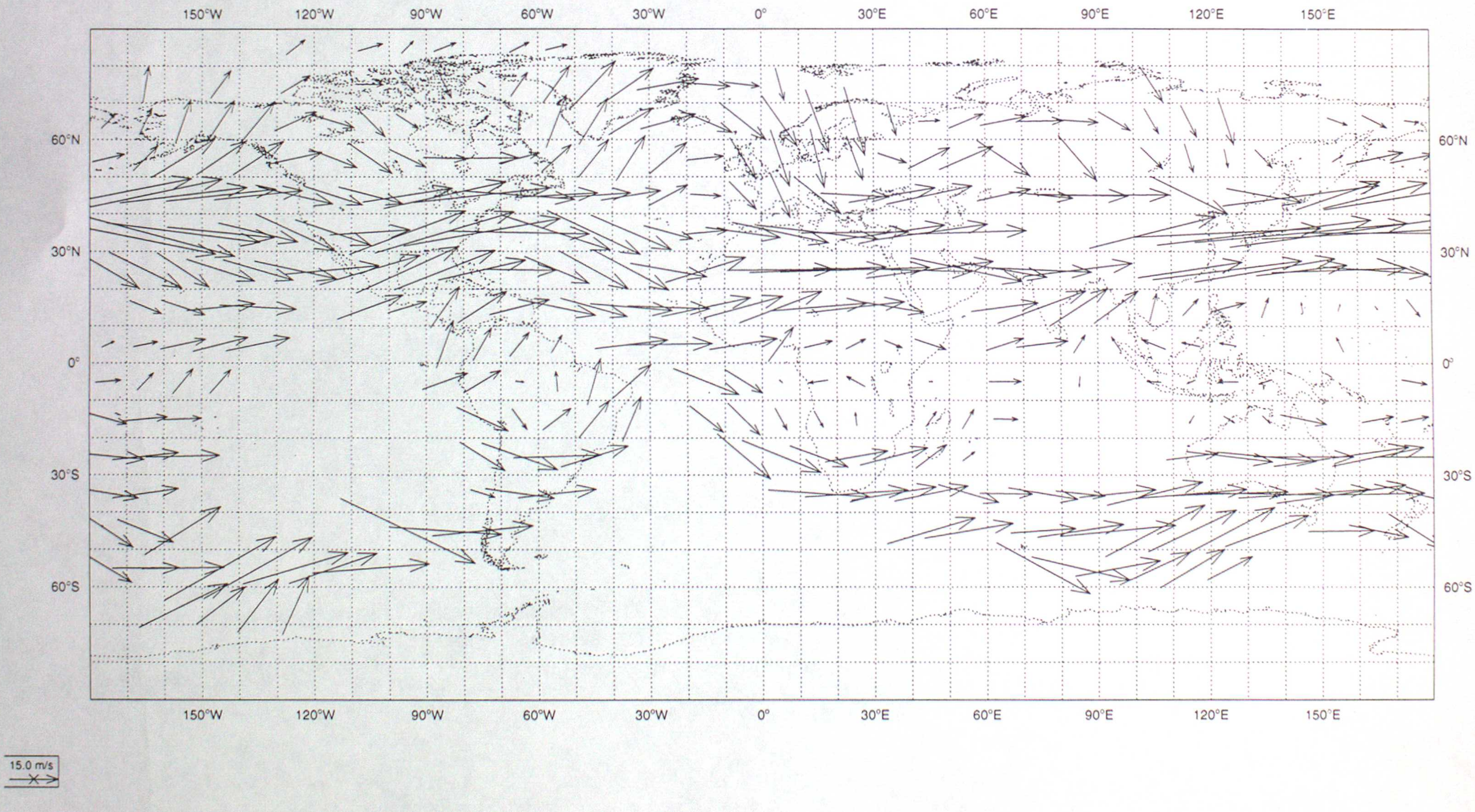


Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

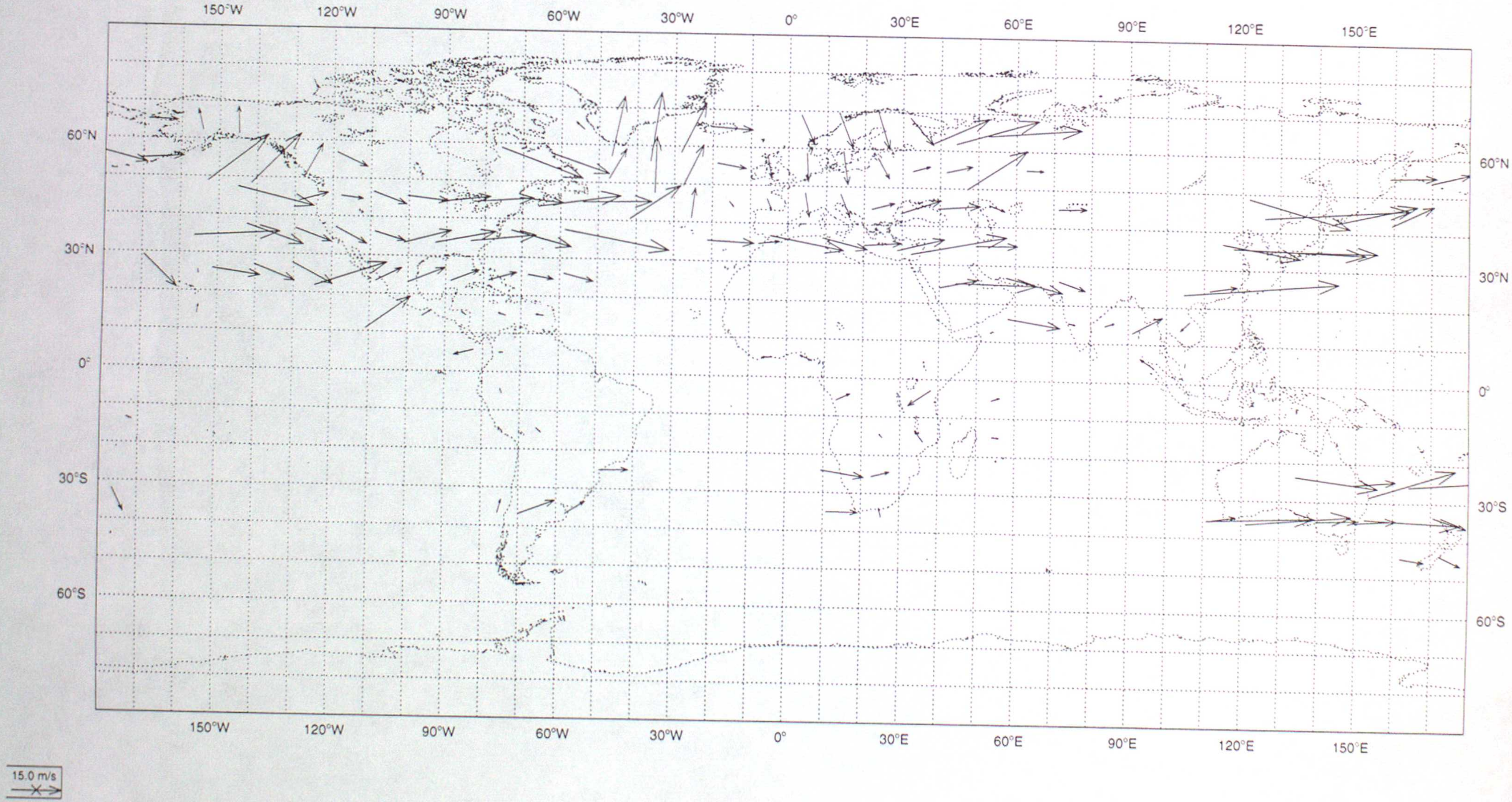


Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

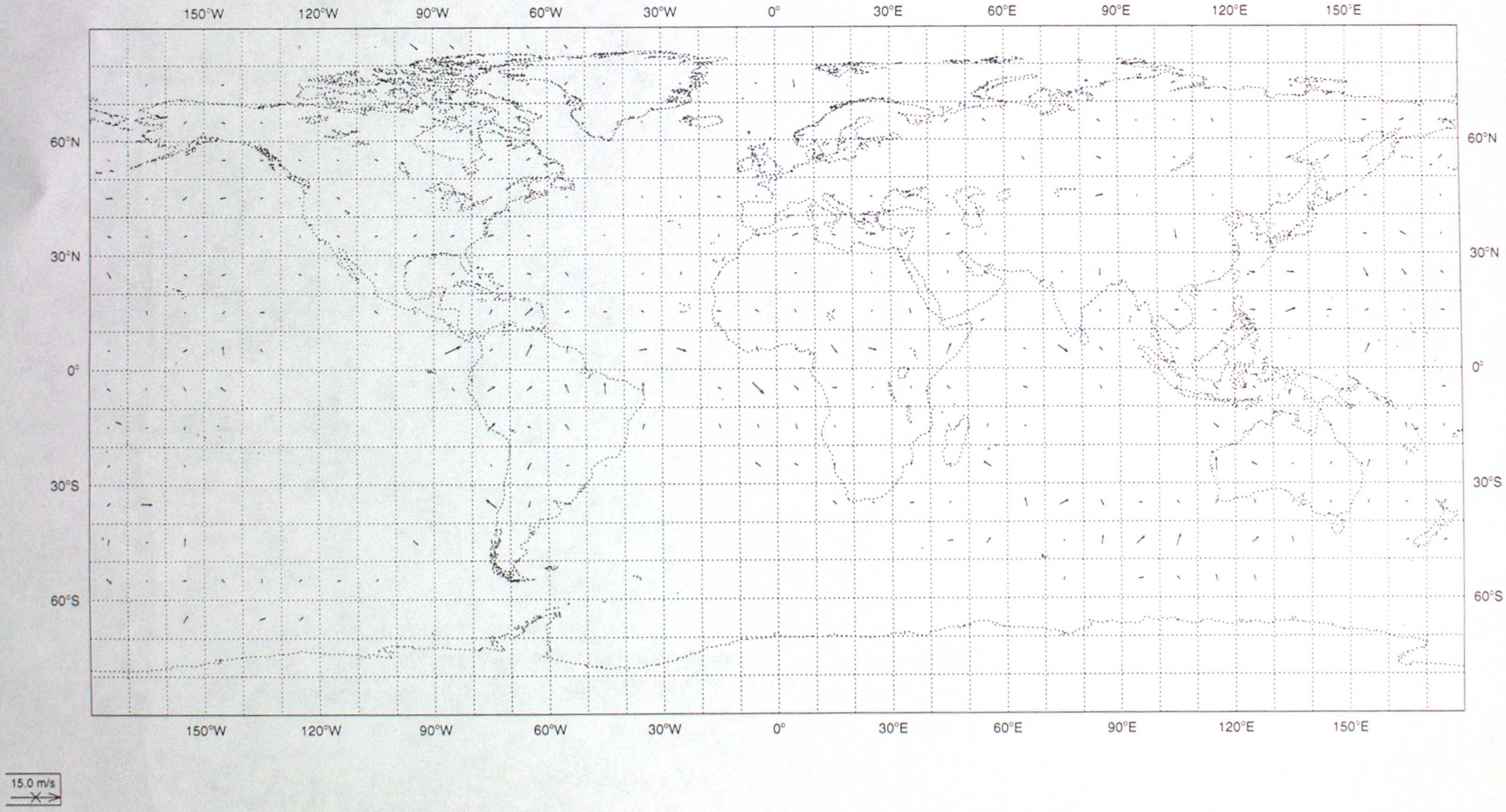


Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

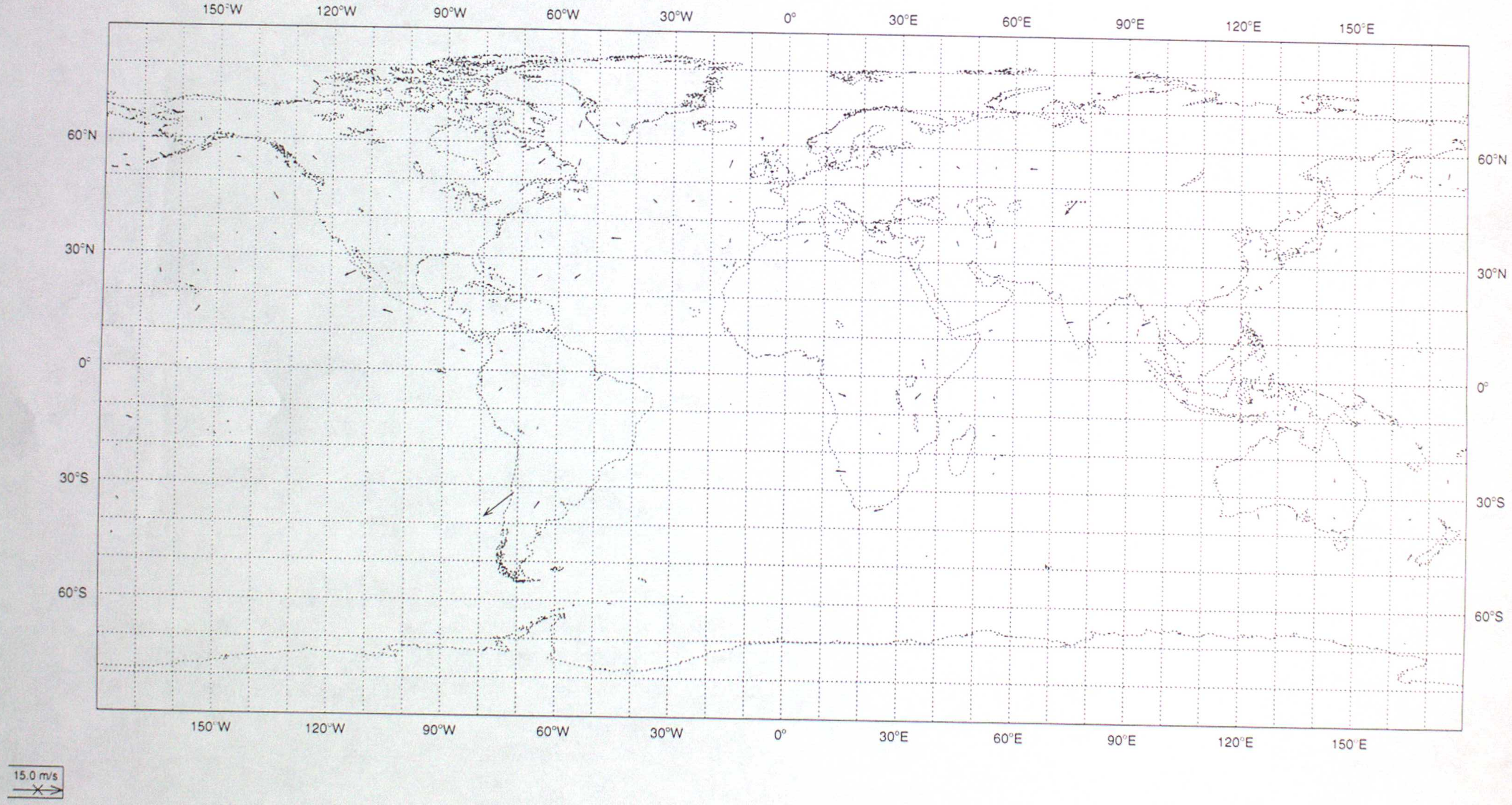


Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

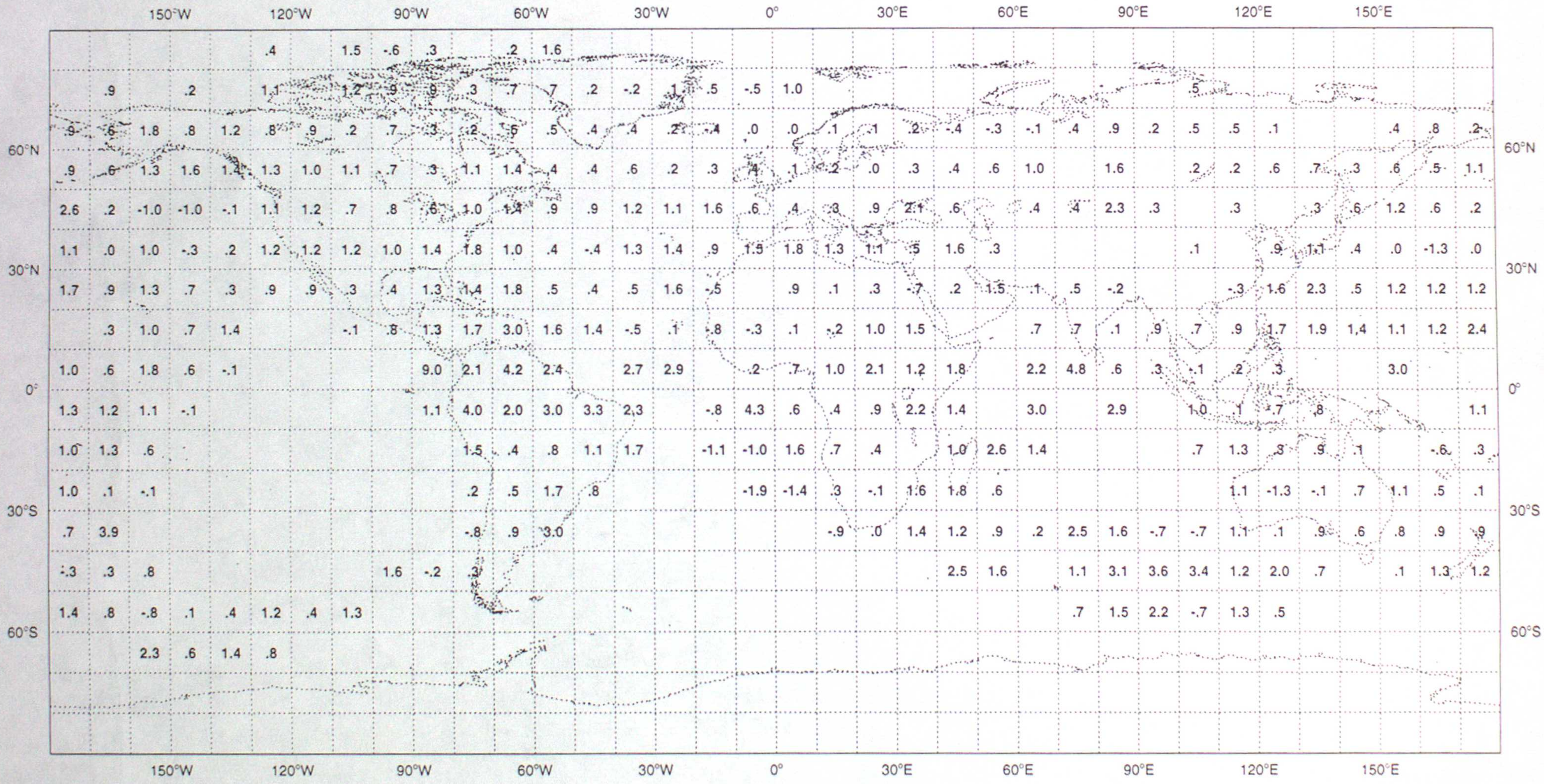


Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

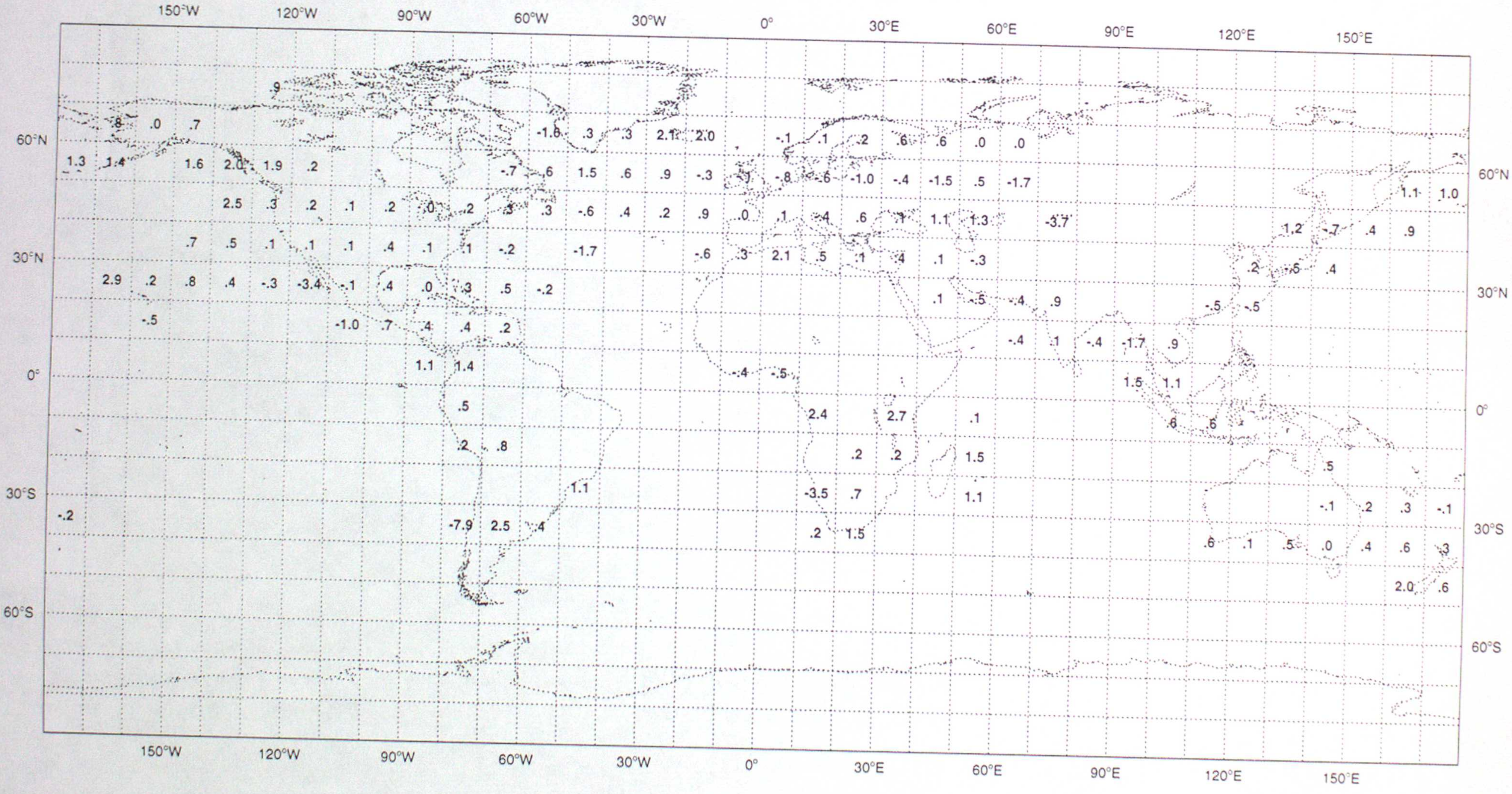


Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

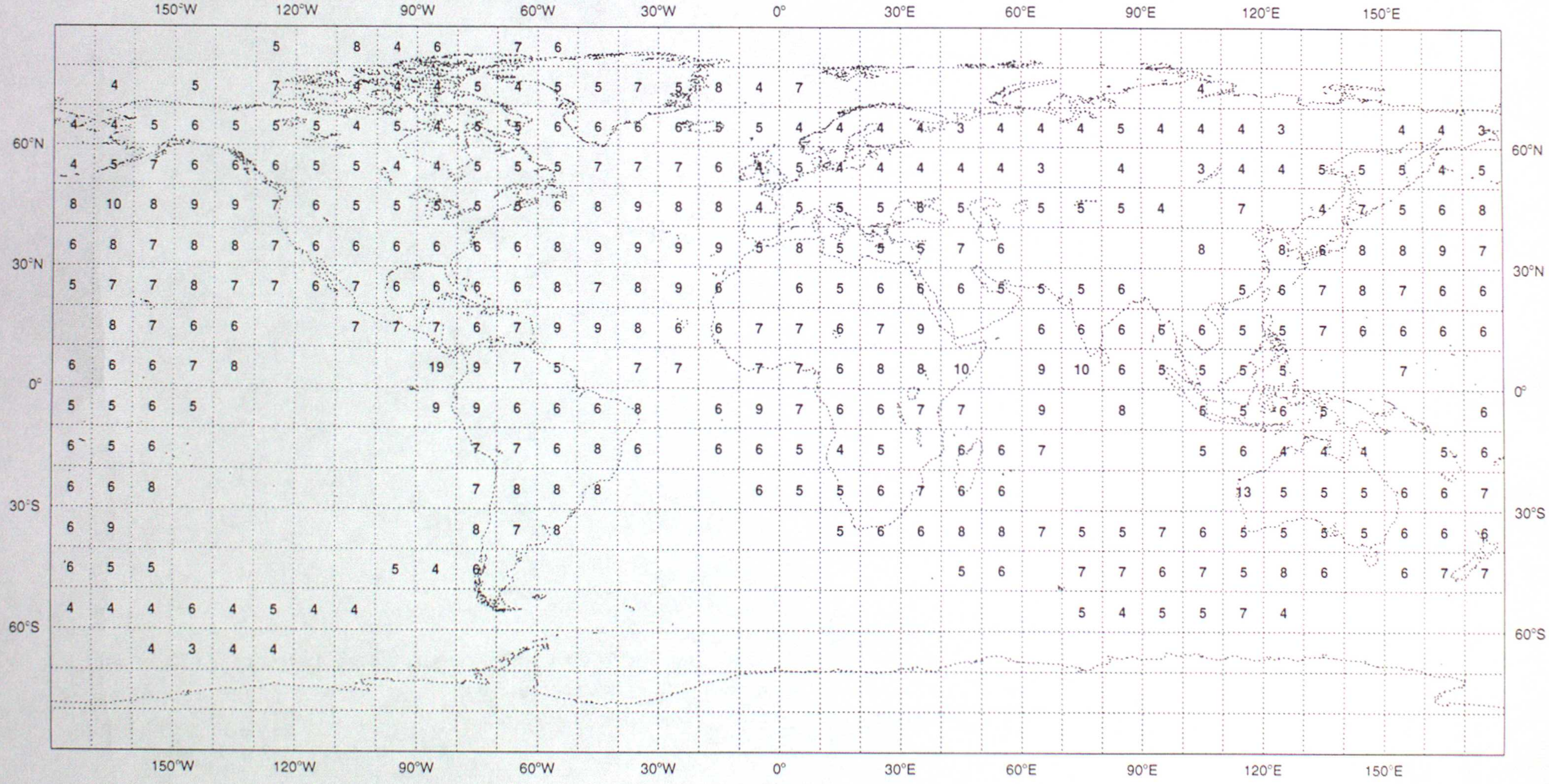


Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). DECEMBER 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

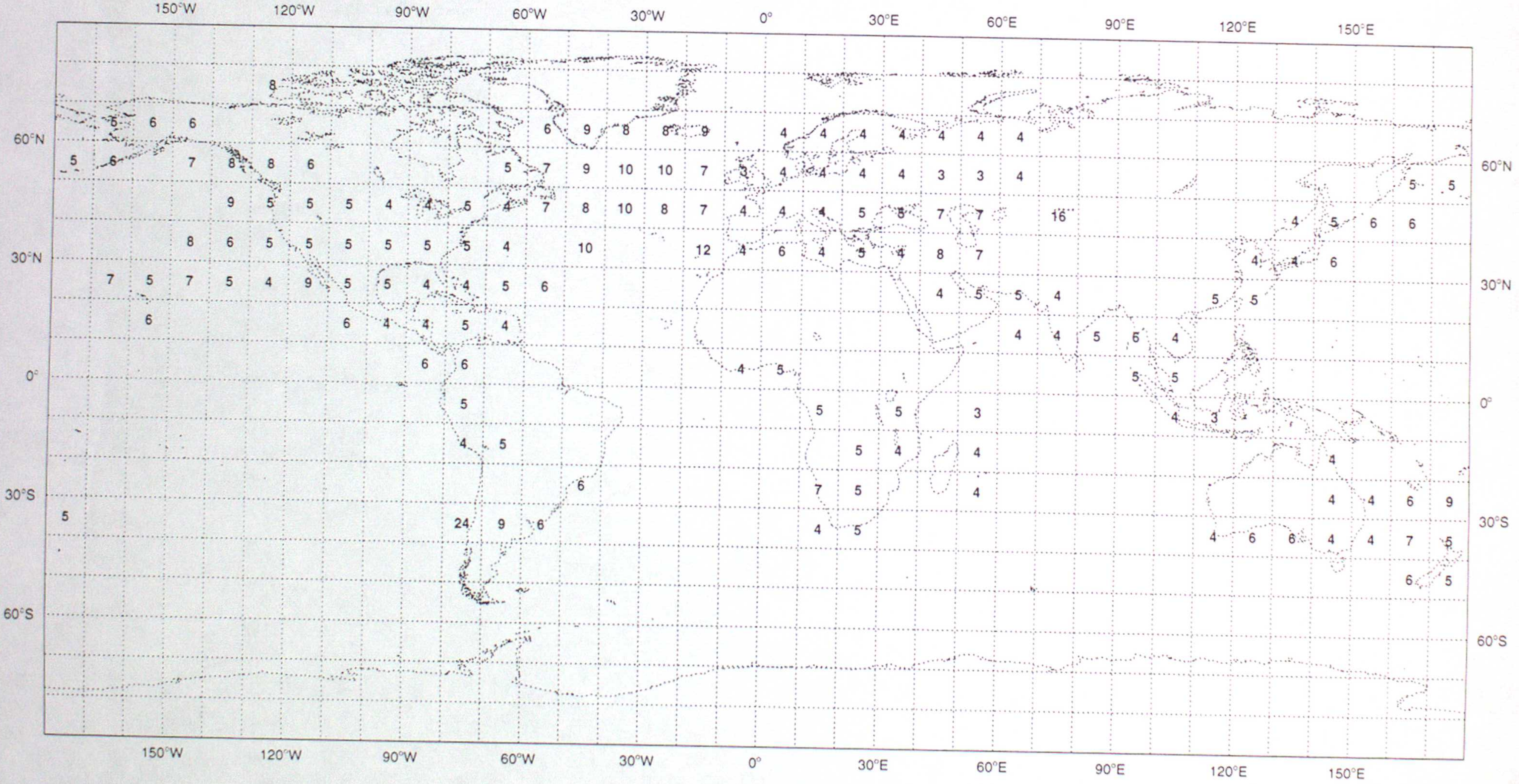


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	70	73/ 80	9	1	69.1	252.3	261.6	6
23418	00	Z	30	65/ 57	24	2	113.3	197.6	227.8	4
31168	00	Z	100	56/ 138	12	0	46.0	213.1	218.0	6
32098	00	Z	100	49/ 143	28	0	33.4	132.5	136.7	5
33345	00	Z	100	50/ 31	25	0	27.5	-137.6	140.3	6
33345	12	Z	100	50/ 31	26	0	27.2	-103.2	106.7	5
33631	00	Z	70	49/ 22	15	0	30.3	-156.5	159.4	7
33791	12	Z	300	48/ 33	23	0	26.1	-63.3	68.5	4
33837	00	Z	30	46/ 31	10	0	217.6	46.1	222.4	7
34247	12	Z	50	50/ 41	27	0	77.0	199.0	213.4	8
34300	00	Z	70	50/ 36	22	0	29.9	-158.6	161.4	6
34731	00	Z	70	47/ 40	12	0	90.7	120.0	150.4	4
42027	12	Z	250	34/ 75	10	0	80.2	37.8	88.7	4
42182	00	Z	100	29/ 77	28	1	56.2	-124.0	136.2	5
42314	00	Z	30	27/ 95	11	0	117.8	145.1	186.9	5
42314	12	Z	150	27/ 95	16	0	92.8	-78.4	121.5	6
42339	00	Z	200	26/ 73	21	1	78.3	-38.4	87.2	5
42339	12	Z	200	26/ 73	14	1	86.7	-89.1	124.3	6
42361	12	Z	100	26/ 78	10	0	104.0	-160.5	191.3	7
42369	00	Z	250	27/ 81	23	0	76.8	-58.0	96.3	8
42369	12	Z	150	27/ 81	19	0	93.1	-65.1	113.6	7
42397	00	Z	150	27/ 88	22	0	58.2	-177.1	186.4	10
42397	12	Z	100	27/ 88	15	5	90.5	-162.7	186.1	10
42647	12	Z	50	23/ 73	14	4	115.7	220.6	249.2	9
42667	00	Z	150	23/ 77	12	0	43.9	-152.9	159.1	5
42701	00	Z	150	23/ 85	14	0	106.1	-43.7	114.8	6
42724	12	Z	200	24/ 91	10	2	52.2	-77.2	93.2	4
42809	12	Z	150	23/ 88	26	1	83.3	-74.8	112.0	5
42867	00	Z	150	21/ 79	20	0	56.7	-107.3	121.4	6
42867	12	Z	150	21/ 79	17	0	108.7	-64.4	126.3	4
43003	00	Z	150	19/ 73	17	0	91.3	-114.1	146.1	6
43003	12	Z	200	19/ 73	25	0	90.5	33.8	96.6	5
43041	00	Z	150	19/ 82	14	2	73.7	-91.4	117.4	6
43041	12	Z	150	19/ 82	14	0	109.2	-98.4	146.9	4
43128	00	Z	150	17/ 78	28	1	70.7	-120.6	139.8	5
43150	00	Z	200	18/ 83	25	0	62.3	-52.9	81.7	4
43192	00	Z	200	15/ 74	16	2	77.6	-146.1	165.4	8
43192	12	Z	200	15/ 74	20	0	66.0	-76.6	101.1	5
43279	12	Z	70	13/ 80	15	0	116.4	55.5	128.9	4
43285	00	Z	30	13/ 75	11	0	139.3	121.0	184.5	5
43295	00	Z	50	13/ 78	16	0	120.2	107.7	161.4	5
43333	00	Z	30	12/ 93	14	0	104.4	177.6	206.0	5
43333	12	Z	150	12/ 93	19	0	79.7	-100.1	127.9	5
43346	00	Z	100	11/ 80	24	0	100.1	-99.8	141.3	5
43346	12	Z	30	11/ 80	16	0	97.0	176.6	201.5	4
43353	00	Z	200	10/ 76	20	0	85.1	-83.5	119.3	6
43466	12	Z	200	7/ 80	6	0	86.0	-58.2	103.8	4
82332	12	Z	30	-3/ -60	4	0	33.6	257.7	259.9	4
83827	12	Z	50	-26/ -55	2	0	7.0	182.0	182.1	4
89592	00	Z	50	-67/ 93	28	0	45.0	158.2	164.5	5
91366	00	Z	50	9/ 168	26	1	87.6	226.5	242.8	7

Figure 8. TEMP 500 hPa geopotential mean daily count. DECEMBER 2001
All hours
Global average number of observations in 24 hours = 1163

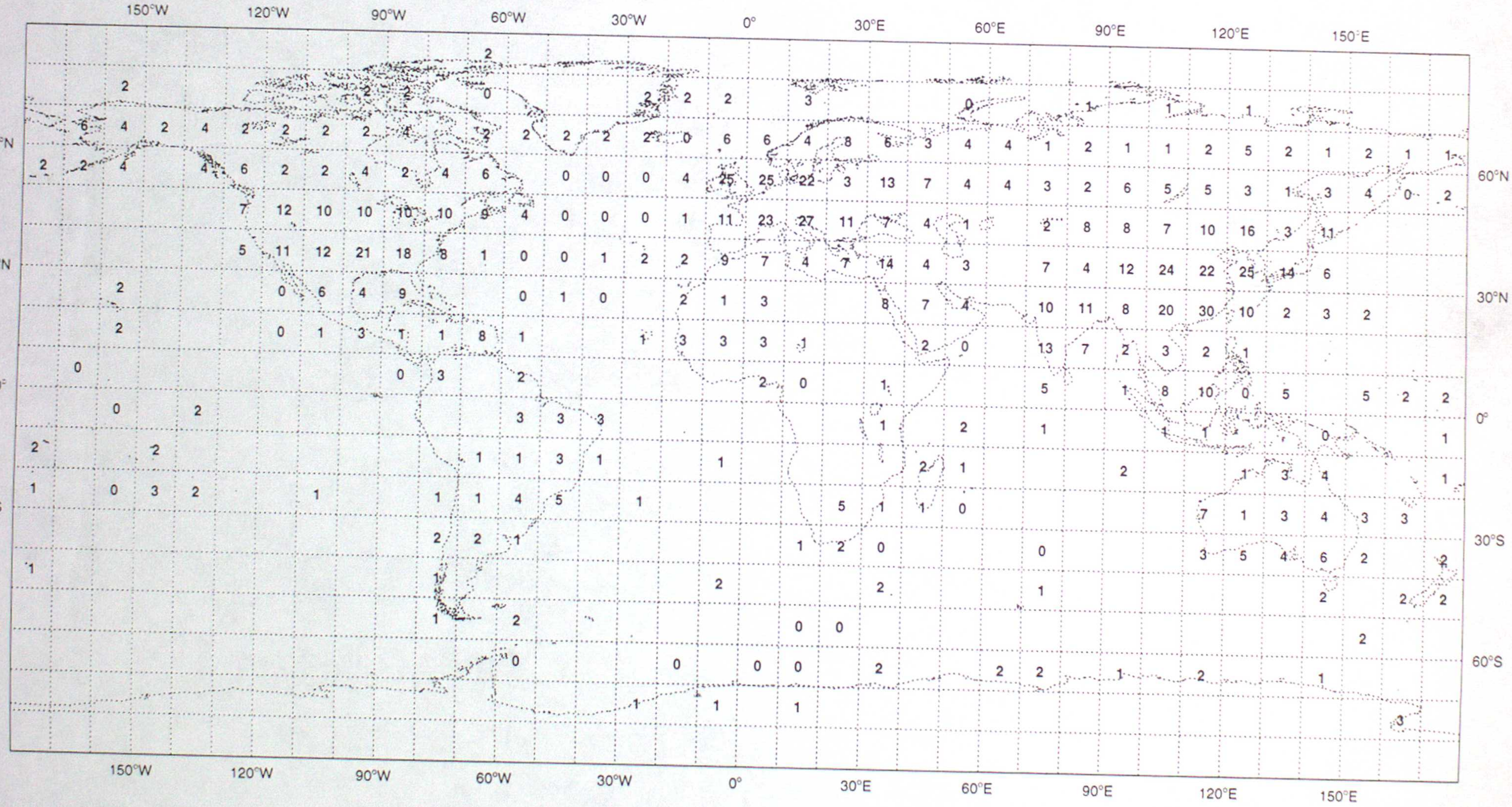


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
FNOR	12	V	250	19/ -57	11	0	9	-6.9	1.4	25.3	1
PSPIU	00	V	150	-5/ -81	28	0	100	-10.3	-3.5	27.0	3
PSPIU	12	V	150	-5/ -81	28	0	100	-11.8	-3.1	30.6	4
06447	00	V	300	51/ 4	14	0	21	-11.5	4.5	27.0	5
40100	00	V	850	34/ 35	12	0	8	0.9	-1.7	15.1	1
40375	00	V	250	28/ 37	24	0	100	-10.2	-0.3	22.3	5
40582	00	V	150	29/ 48	24	0	4	-2.3	-0.5	25.4	1
40754	12	V	300	36/ 51	21	0	14	8.4	-0.3	19.1	4
41112	12	V	150	18/ 43	26	0	3	-6.7	1.3	23.3	1
42369	00	V	250	27/ 81	22	0	100	-9.2	-1.4	19.0	3
42397	00	V	250	27/ 88	23	0	100	-4.9	-8.7	15.7	2
42397	12	V	200	27/ 88	23	1	100	-9.4	-5.7	18.5	3
42410	00	V	300	26/ 92	15	0	100	-5.6	-2.3	19.8	2
42410	12	V	300	26/ 92	10	0	100	-9.1	-1.9	18.4	2
42667	12	V	250	23/ 77	16	0	100	-6.6	11.3	15.5	1
42724	00	V	300	24/ 91	16	0	100	-3.5	-3.4	15.1	1
42809	12	V	300	23/ 88	26	0	53	4.8	-6.8	15.1	1
48407	12	V	150	15/ 105	20	0	100	-6.7	-10.2	16.4	1
48455	12	V	150	14/ 101	27	0	100	-6.6	-6.8	15.2	1
53915	12	V	100	36/ 107	29	1	17	8.9	3.6	15.8	1
56691	00	V	100	27/ 104	28	1	100	8.5	4.2	19.6	2
56691	12	V	150	27/ 104	30	0	100	6.2	8.1	17.3	1
58968	12	V	200	25/ 122	30	0	100	-2.9	-6.7	18.3	3
60656	12	V	150	28/ -8	14	0	50	-8.6	-0.6	28.1	1
62337	00	V	200	31/ 34	22	0	100	-10.9	11.8	17.9	5
62337	12	V	200	31/ 34	28	0	100	-9.8	12.0	17.5	4
62378	00	V	200	30/ 31	21	0	100	-14.4	-6.5	23.3	5
62378	12	V	200	30/ 31	26	0	100	-18.6	-8.4	23.3	5
68512	12	V	200	-30/ 18	23	0	100	-14.0	1.2	18.9	4
72451	12	V	250	38/-100	30	0	3	-1.9	1.9	16.5	1
96413	00	V	100	1/ 110	31	0	6	11.2	-0.2	15.8	1
98223	00	V	150	18/ 121	10	0	10	5.9	10.4	16.4	2

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. DECEMBER 2001
All hours
Global average number of observations in 24 hours = 1353

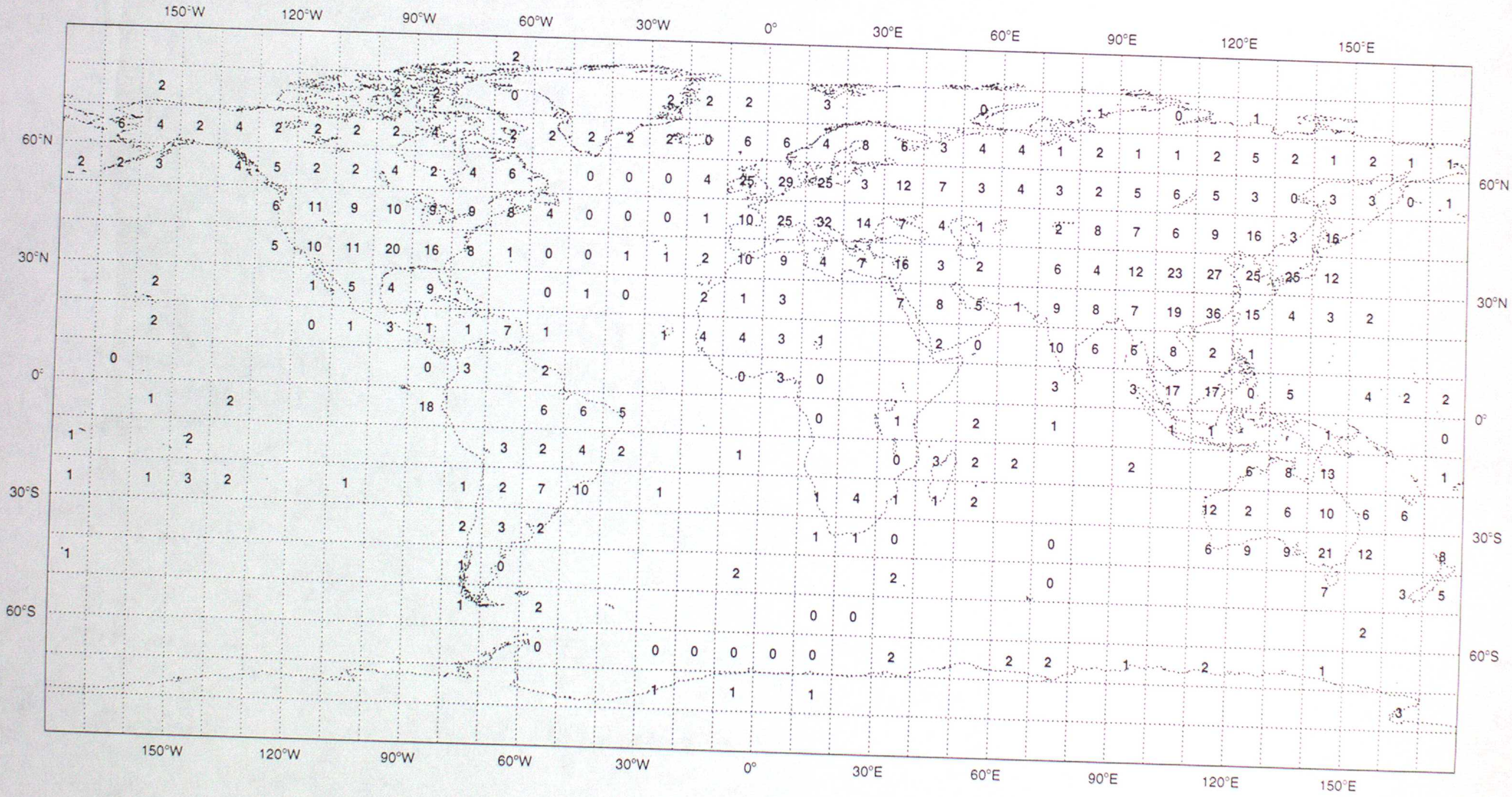


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
11722	12	DD	49/ 17	24	-10.5	3.4	13.5
17280	00	DD	38/ 40	30	-10.3	6.4	10.4
29612	12	DD	55/ 78	24	23.5	3.1	8.0
31510	00	DD	51/ 127	18	-11.1	3.0	9.8
42667	00	DD	23/ 77	15	-22.8	2.8	8.6
57816	12	DD	26/ 107	30	-10.1	2.4	5.6
58968	12	DD	25/ 122	30	13.0	1.9	20.6
62337	00	DD	31/ 34	25	-20.2	2.4	6.2
62337	12	DD	31/ 34	28	-19.6	1.0	5.7
62378	00	DD	30/ 31	23	11.8	3.6	15.3
62378	12	DD	30/ 31	25	14.1	2.4	11.1
68442	12	DD	-29/ 26	6	-10.7	6.2	22.6

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: December 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

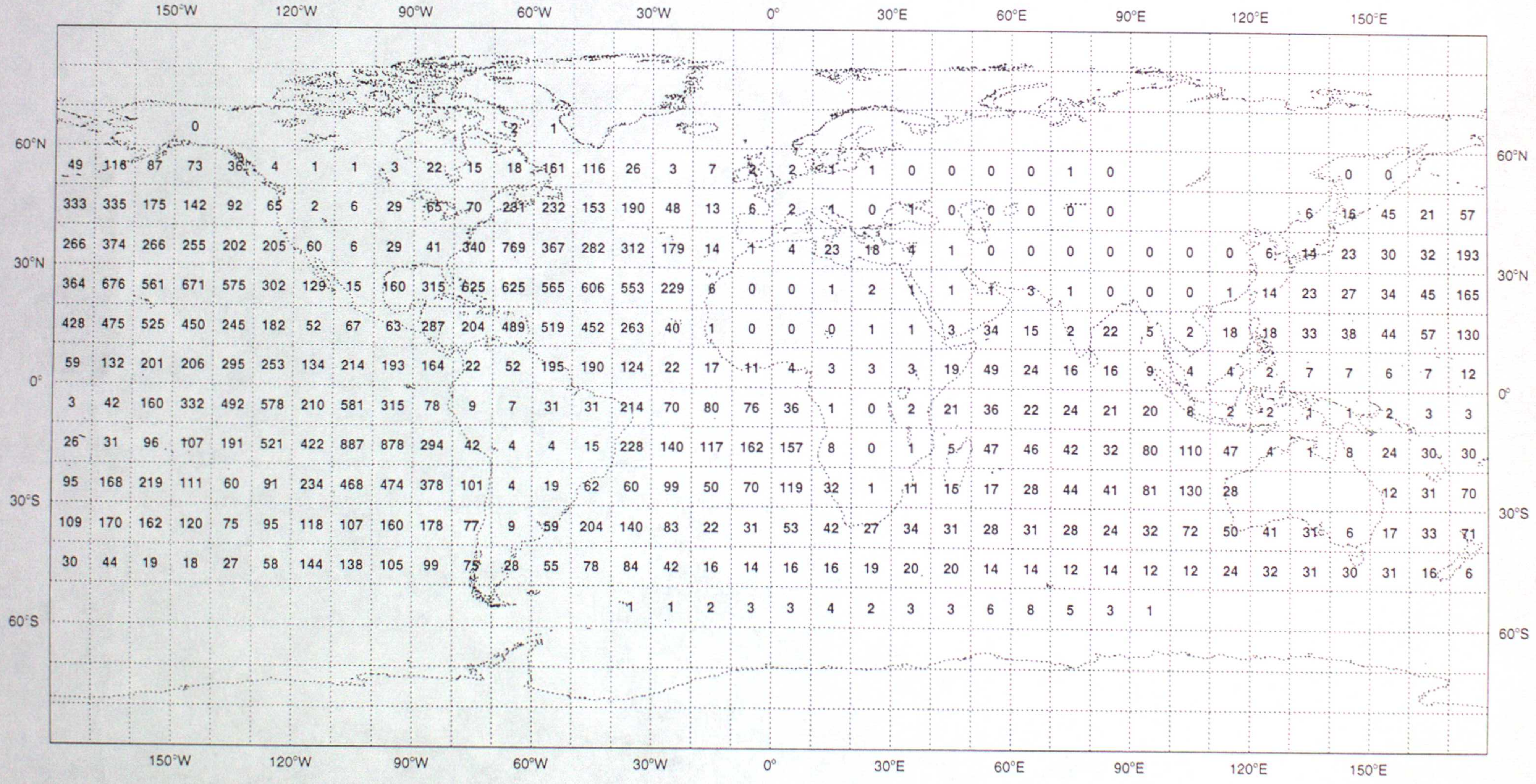
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. DECEMBER 2001
Global average number of observations in 24 hours = 38342



			0								2	1																							
49	116	87	73	36	4	1	1	3	22	15	18	161	116	26	3	7	2	2	1	1	0	0	0	0	1	0						0	0		
333	335	175	142	92	65	2	6	29	65	70	231	232	153	190	48	13	6	2	1	0	1	0	0	0	0	0					6	16	45	21	57
266	374	266	255	202	205	60	6	29	41	340	769	367	282	312	179	14	1	4	23	18	4	1	0	0	0	0	0	0	0	6	14	23	30	32	193
364	676	561	671	575	302	129	15	160	315	625	625	565	606	553	229	6	0	0	1	2	1	1	1	3	1	0	0	0	1	14	23	27	34	45	165
428	475	525	450	245	182	52	67	63	287	204	489	519	452	263	40	1	0	0	0	1	1	3	34	15	2	22	5	2	18	18	33	38	44	57	130
59	132	201	206	295	253	134	214	193	164	22	52	195	190	124	22	17	11	4	3	3	3	19	49	24	16	16	9	4	4	2	7	7	6	7	12
3	42	160	332	492	578	210	581	315	78	9	7	31	31	214	70	80	76	36	1	0	2	21	36	22	24	21	20	8	2	2	1	1	2	3	3
26	31	96	107	191	521	422	887	878	294	42	4	4	15	228	140	117	162	157	8	0	1	5	47	46	42	32	80	110	47	4	1	8	24	30	30
95	168	219	111	60	91	234	468	474	378	101	4	19	62	60	99	50	70	119	32	1	11	15	17	28	44	41	81	130	28				12	31	70
109	170	162	120	75	95	118	107	160	178	77	9	59	204	140	83	22	31	53	42	27	34	31	28	31	28	24	32	72	50	41	31	6	17	33	71
30	44	19	18	27	58	144	138	105	99	75	28	55	78	84	42	16	14	16	16	19	20	20	14	14	12	14	12	12	24	32	31	30	31	16	6
														1	1	2	3	3	4	2	3	3	6	8	5	3	1								

Figure 11. SATOB 701 - 1000 hPa vector mean wind. DECEMBER 2001
All observations
Arrows are plotted where greater than 10 obs are present

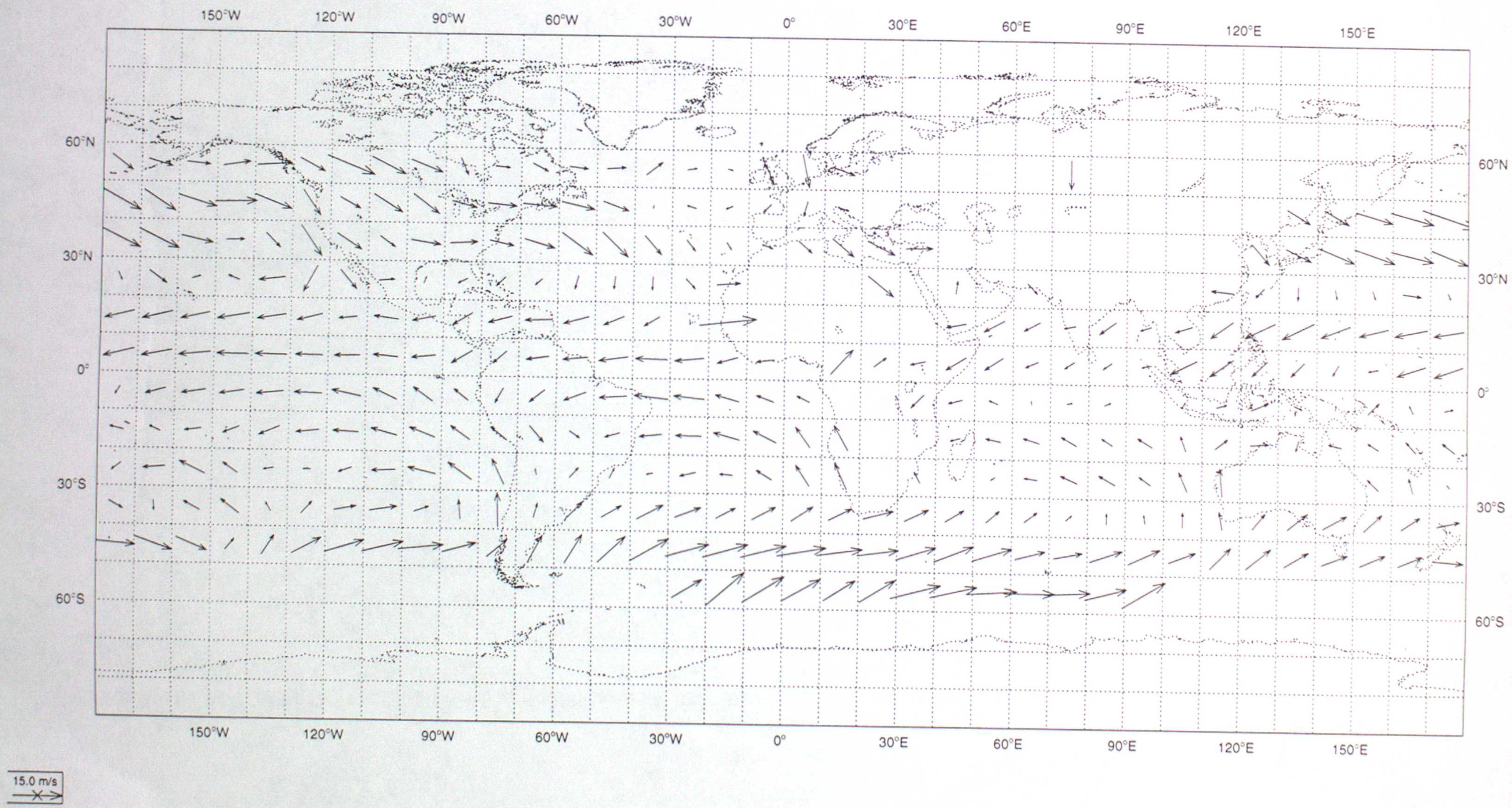


Figure 12. SATOB 701 - 1000 hPa vector wind differences. DECEMBER 2001
All observations
Arrows are plotted where greater than 10 obs are present

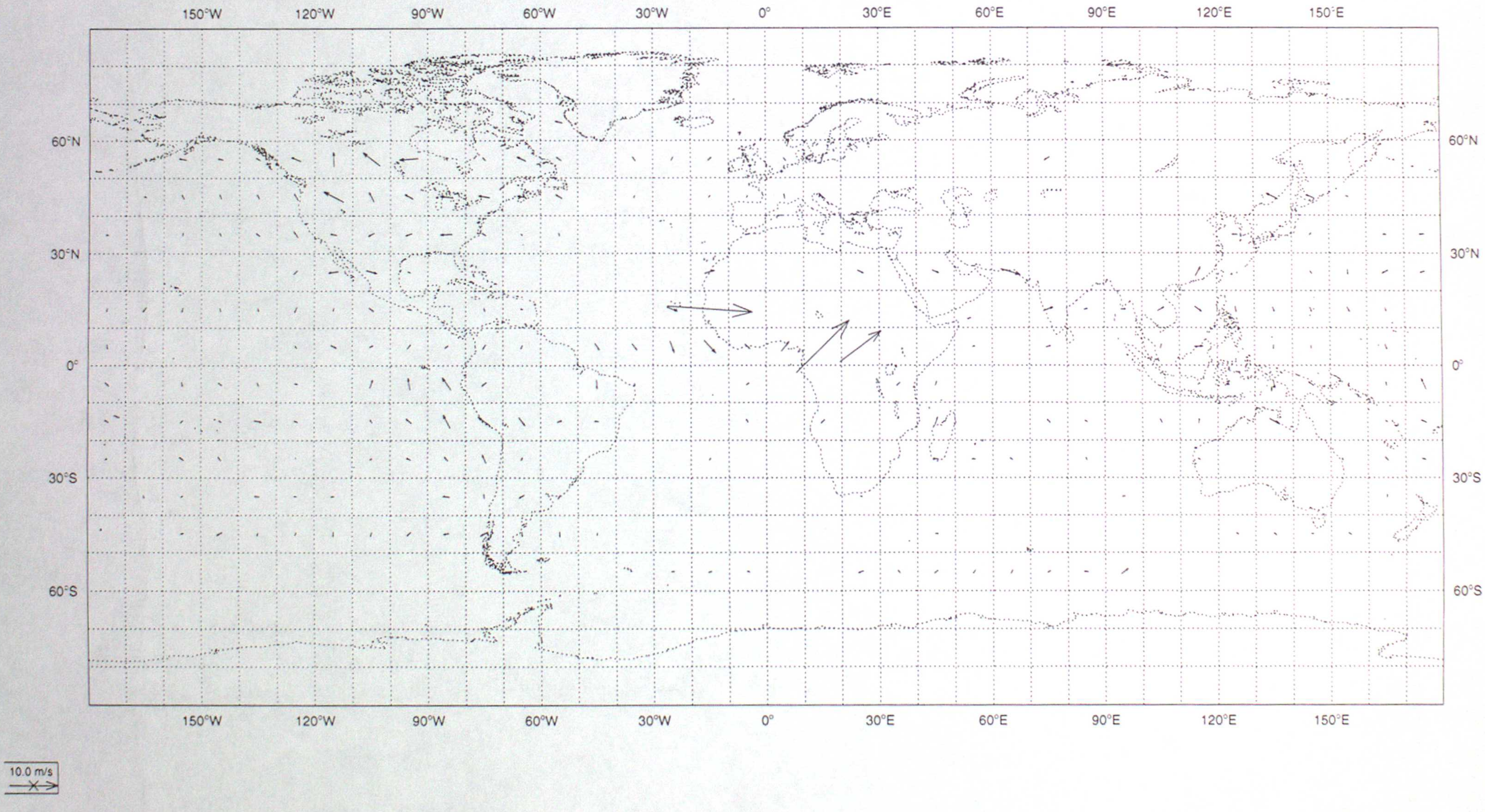


Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). DECEMBER 2001

All observations

Values are plotted where greater than 10 obs are present

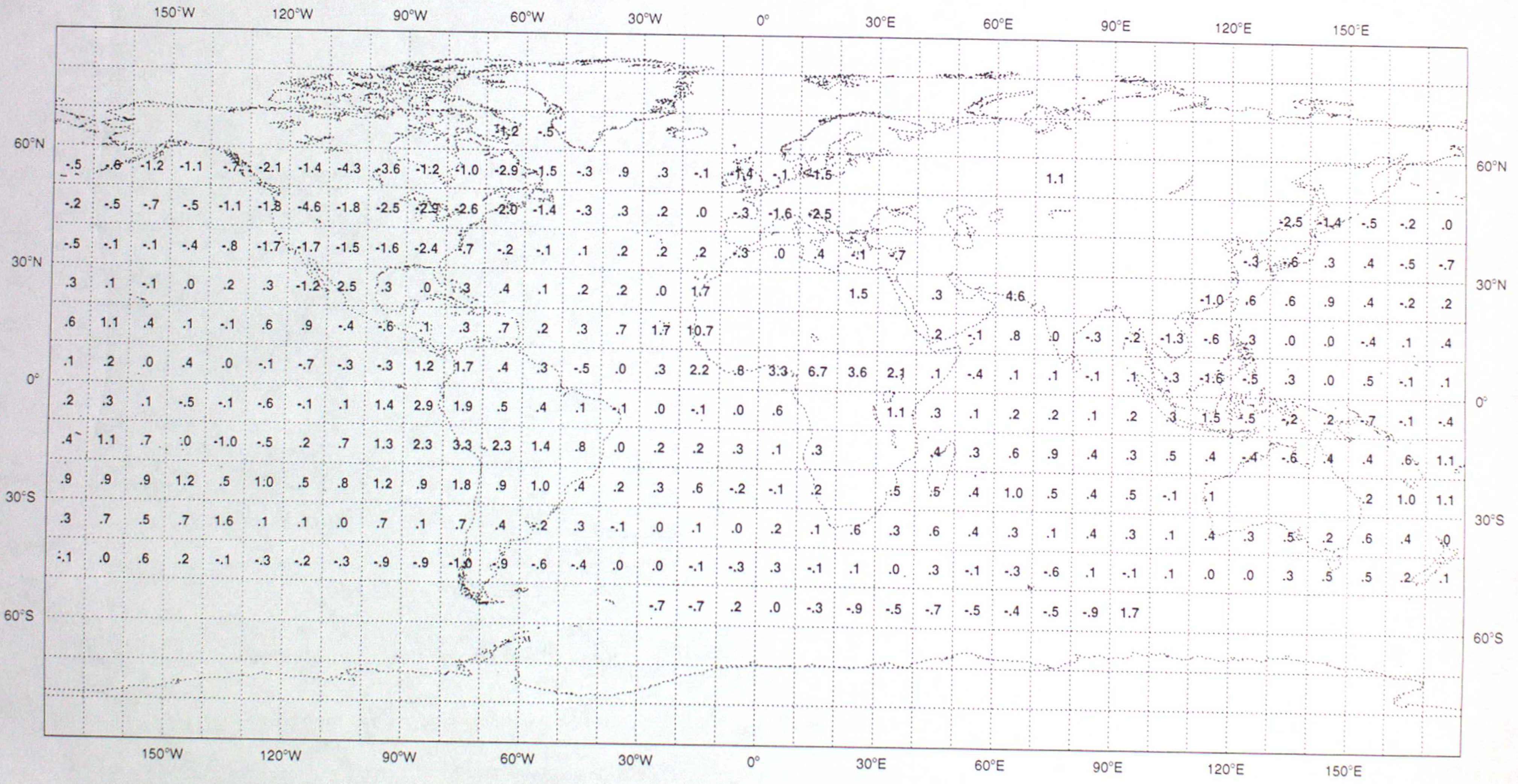


Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). DECEMBER 2001
All observations
Values are plotted where greater than 10 obs are present

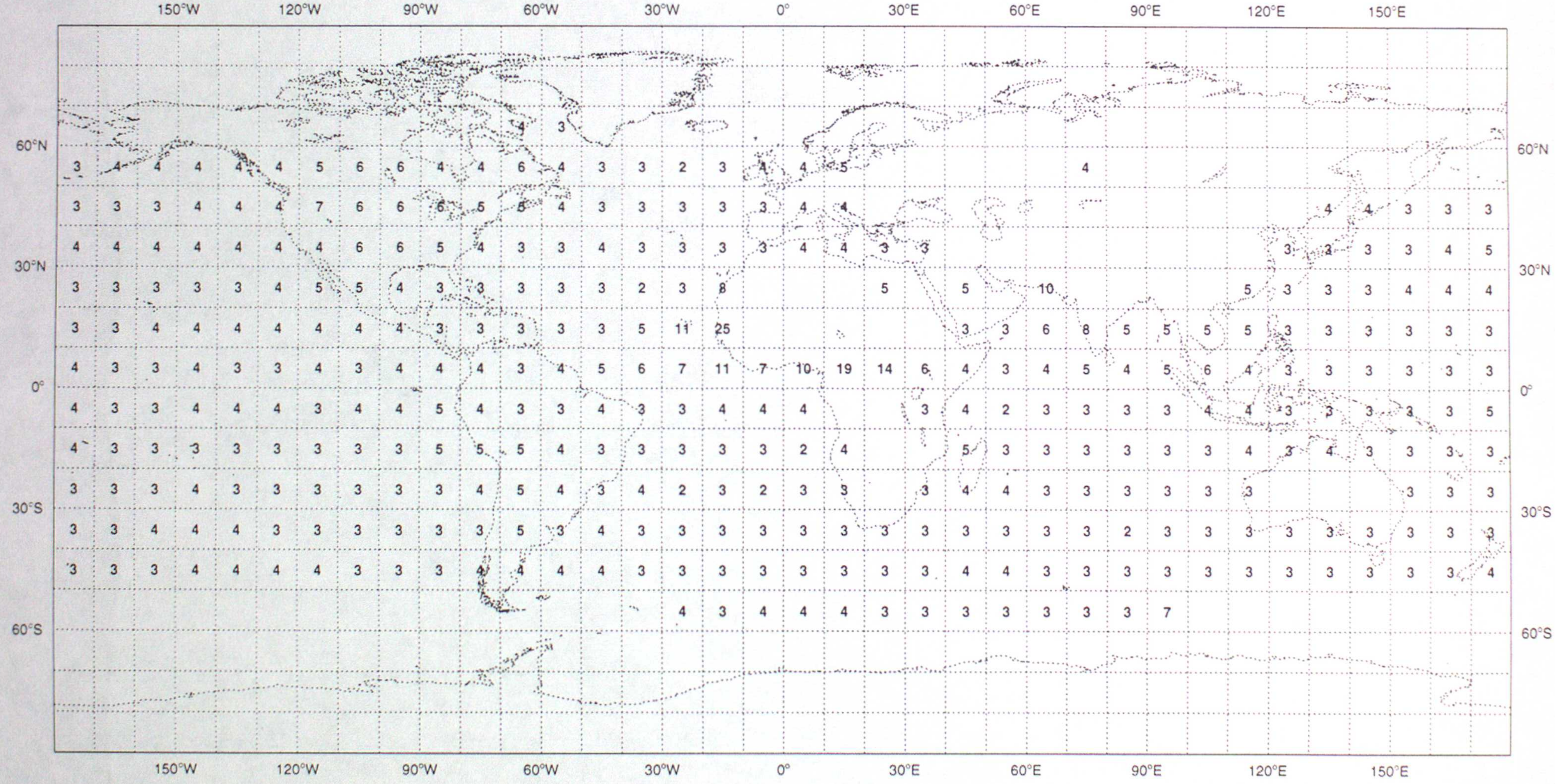
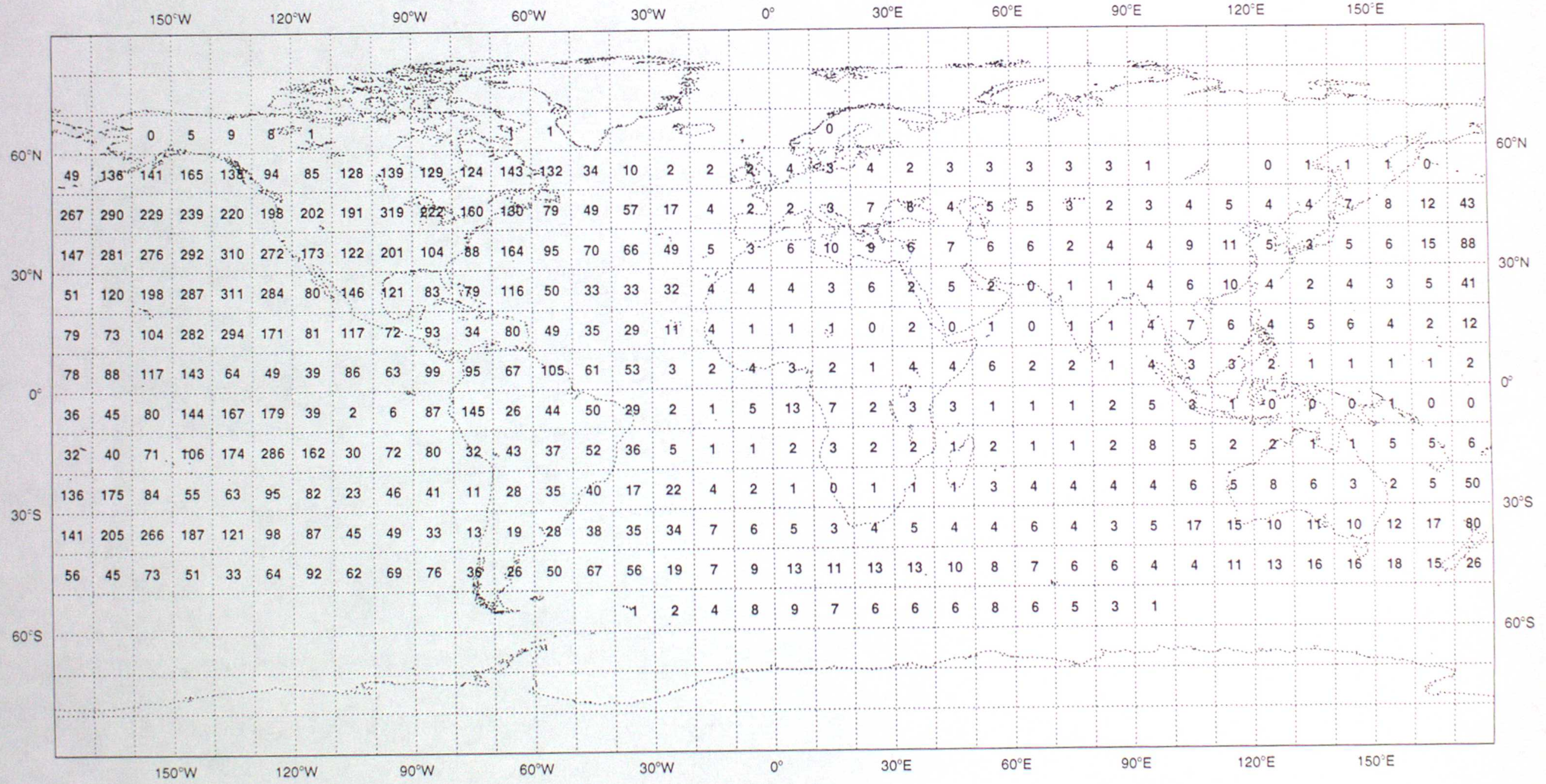


Figure 15. SATOB 401 - 700 hPa mean daily count. DECEMBER 2001
Global average number of observations in 24 hours = 19000



		0	5	9	8	1					1	1							0																
49	136	141	165	138	94	85	128	139	129	124	143	132	34	10	2	2	2	4	3	4	2	3	3	3	3	3	1			0	1	1	1	0	
267	290	229	239	220	198	202	191	319	222	160	130	79	49	57	17	4	2	2	3	7	8	4	5	5	3	2	3	4	5	4	4	7	8	12	43
147	281	276	292	310	272	173	122	201	104	88	164	95	70	66	49	5	3	6	10	9	6	7	6	6	2	4	4	9	11	5	3	5	6	15	88
51	120	198	287	311	284	80	146	121	83	79	116	50	33	33	32	4	4	4	3	6	2	5	2	0	1	1	4	6	10	4	2	4	3	5	41
79	73	104	282	294	171	81	117	72	93	34	80	49	35	29	11	4	1	1	1	0	2	0	1	0	1	1	4	7	6	4	5	6	4	2	12
78	88	117	143	64	49	39	86	63	99	95	67	105	61	53	3	2	4	3	2	1	4	4	6	2	2	1	4	3	3	2	1	1	1	1	2
36	45	80	144	167	179	39	2	6	87	145	26	44	50	29	2	1	5	13	7	2	3	3	1	1	1	2	5	3	1	0	0	0	1	0	0
32	40	71	106	174	286	162	30	72	80	32	43	37	52	36	5	1	1	2	3	2	2	1	2	1	1	2	8	5	2	2	1	1	5	5	6
136	175	84	55	63	95	82	23	46	41	11	28	35	40	17	22	4	2	1	0	1	1	1	3	4	4	4	4	6	5	8	6	3	2	5	50
141	205	266	187	121	98	87	45	49	33	13	19	28	38	35	34	7	6	5	3	4	5	4	4	6	4	3	5	17	15	10	11	10	12	17	80
56	45	73	51	33	64	92	62	69	76	36	26	50	67	56	19	7	9	13	11	13	13	10	8	7	6	6	4	4	11	13	16	16	18	15	26
														1	2	4	8	9	7	6	6	6	8	6	5	3	1								

Figure 16. SATOB 401 - 700 hPa vector mean wind. DECEMBER 2001

All observations

Arrows are plotted where greater than 10 obs are present

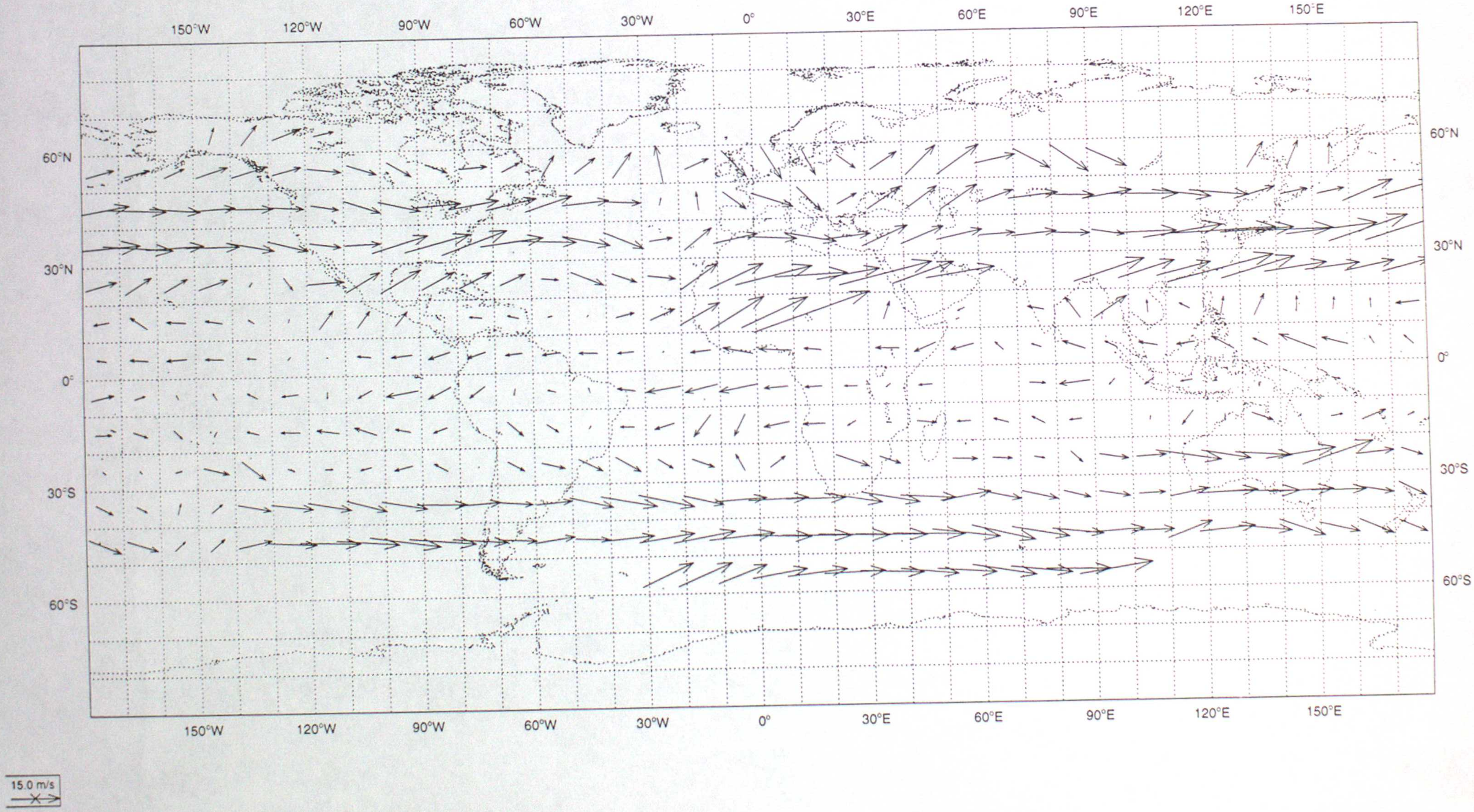


Figure 17. SATOB 401 - 700 hPa vector wind differences. DECEMBER 2001
All observations
Arrows are plotted where greater than 10 obs are present

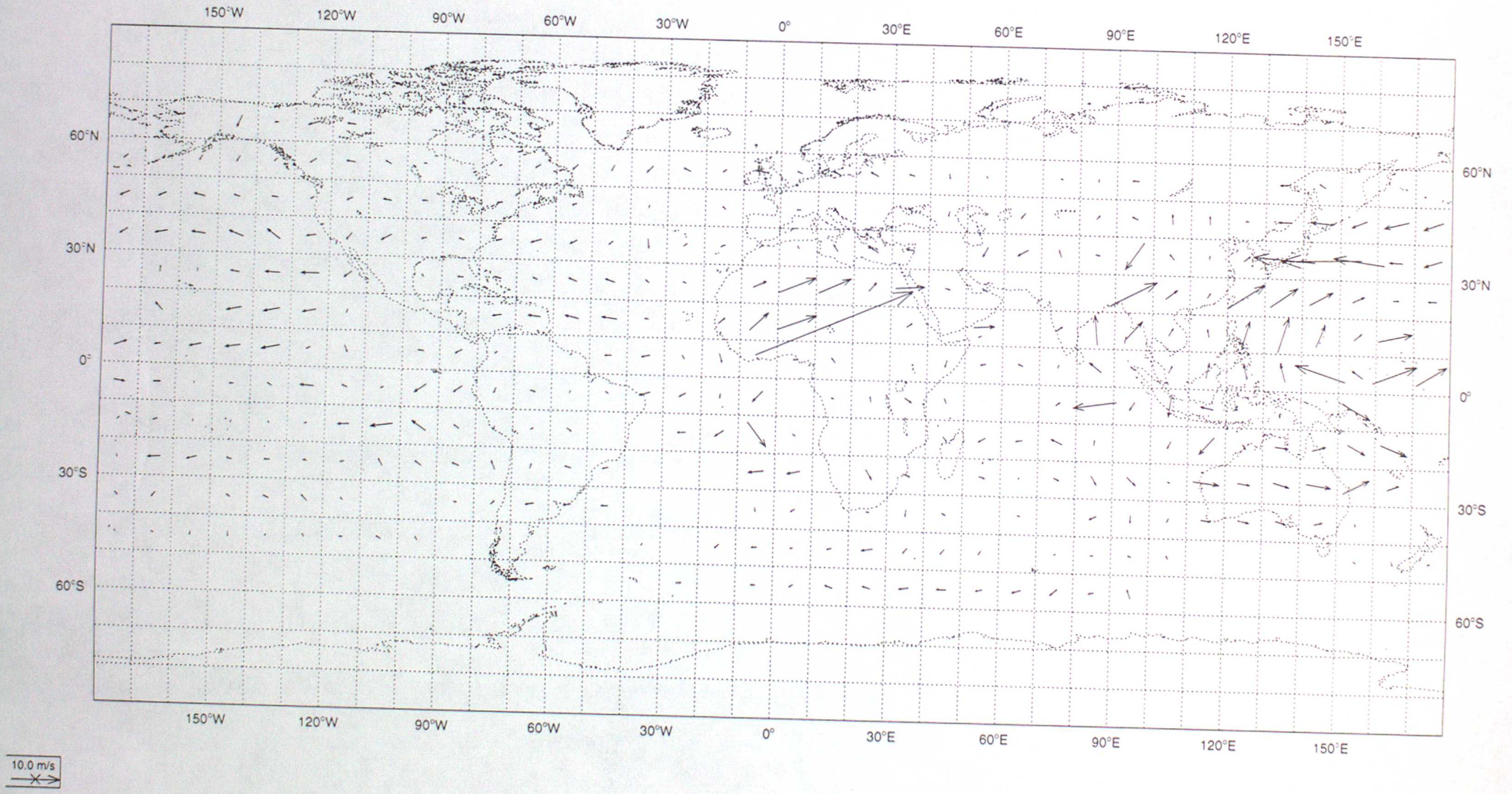


Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). DECEMBER 2001

All observations

Values are plotted where greater than 10 obs are present

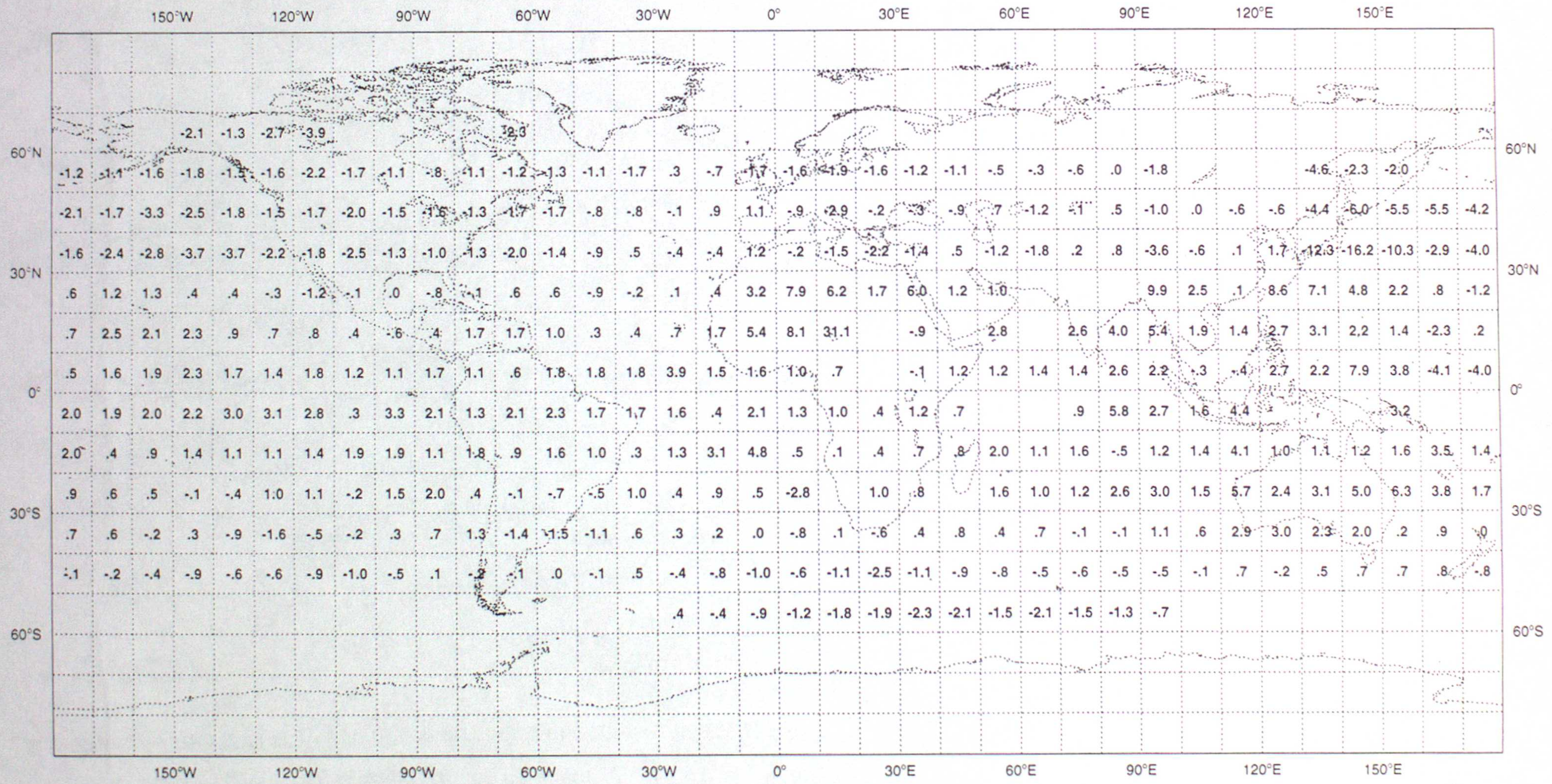


Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). DECEMBER 2001

All observations

Values are plotted where greater than 10 obs are present

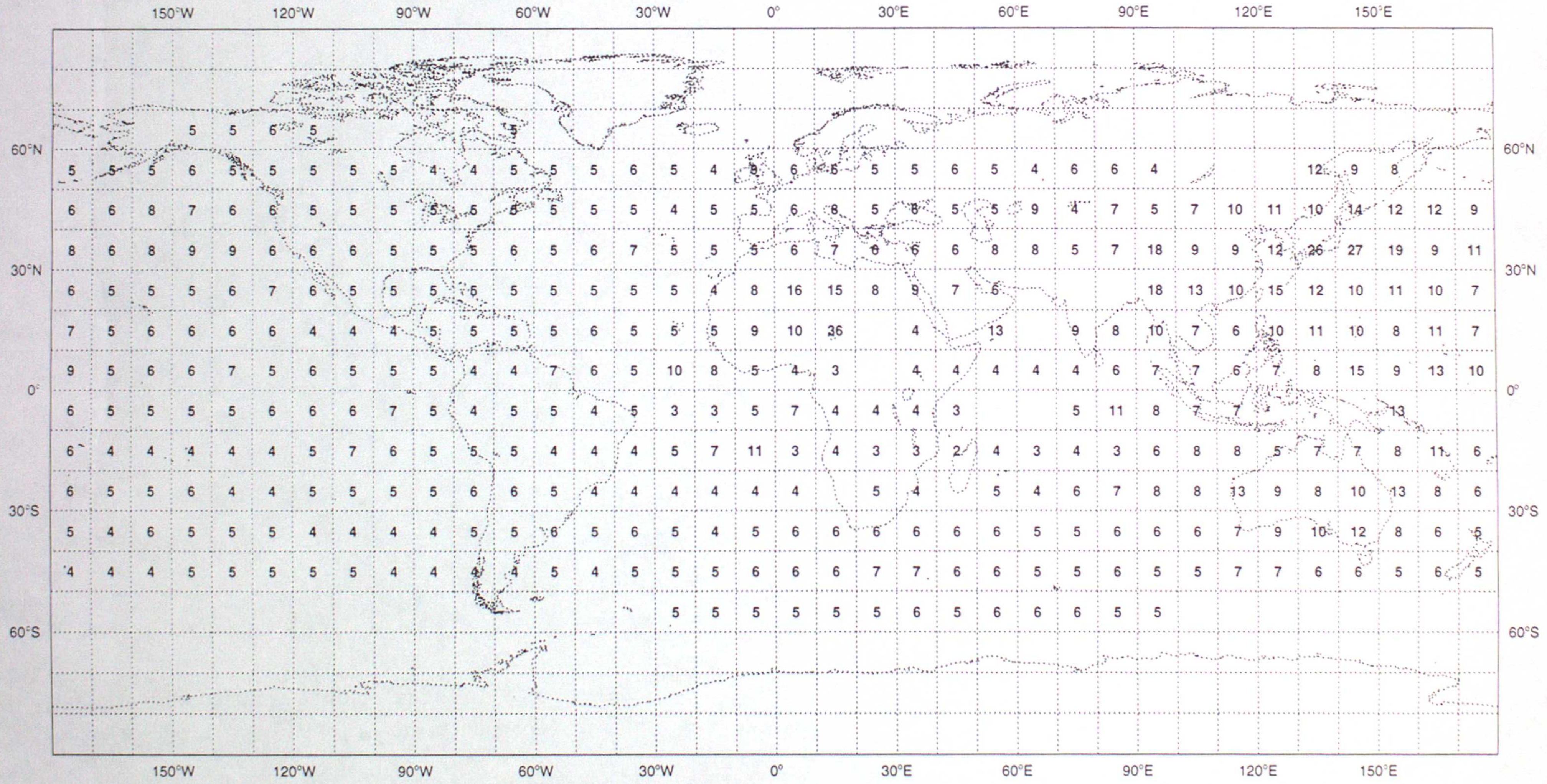


Figure 20. SATOB 101 - 400 hPa mean daily count. DECEMBER 2001
Global average number of observations in 24 hours = 56048

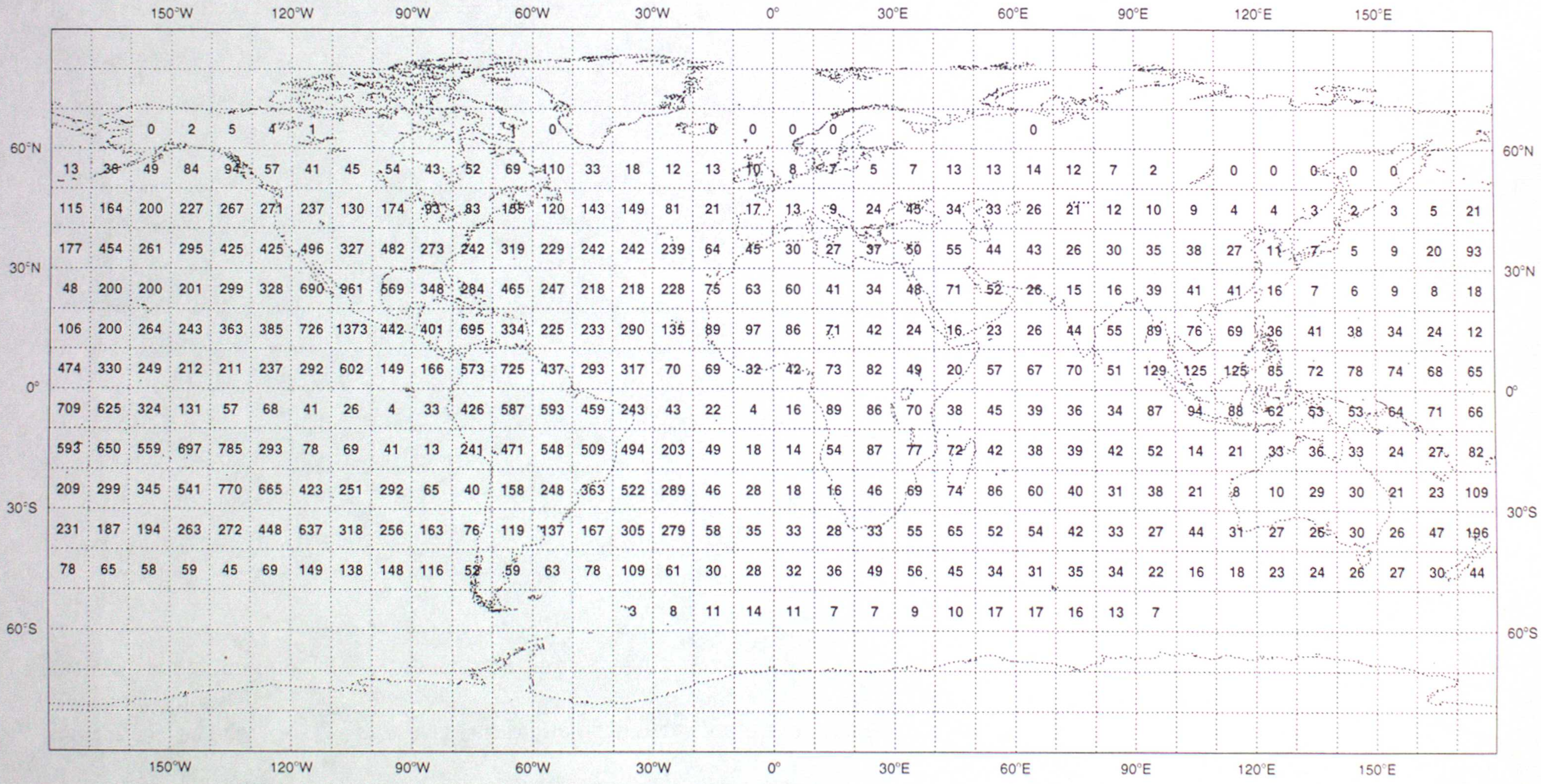


Figure 21. SATOB 101 - 400 hPa vector mean wind. DECEMBER 2001
All observations
Arrows are plotted where greater than 10 obs are present

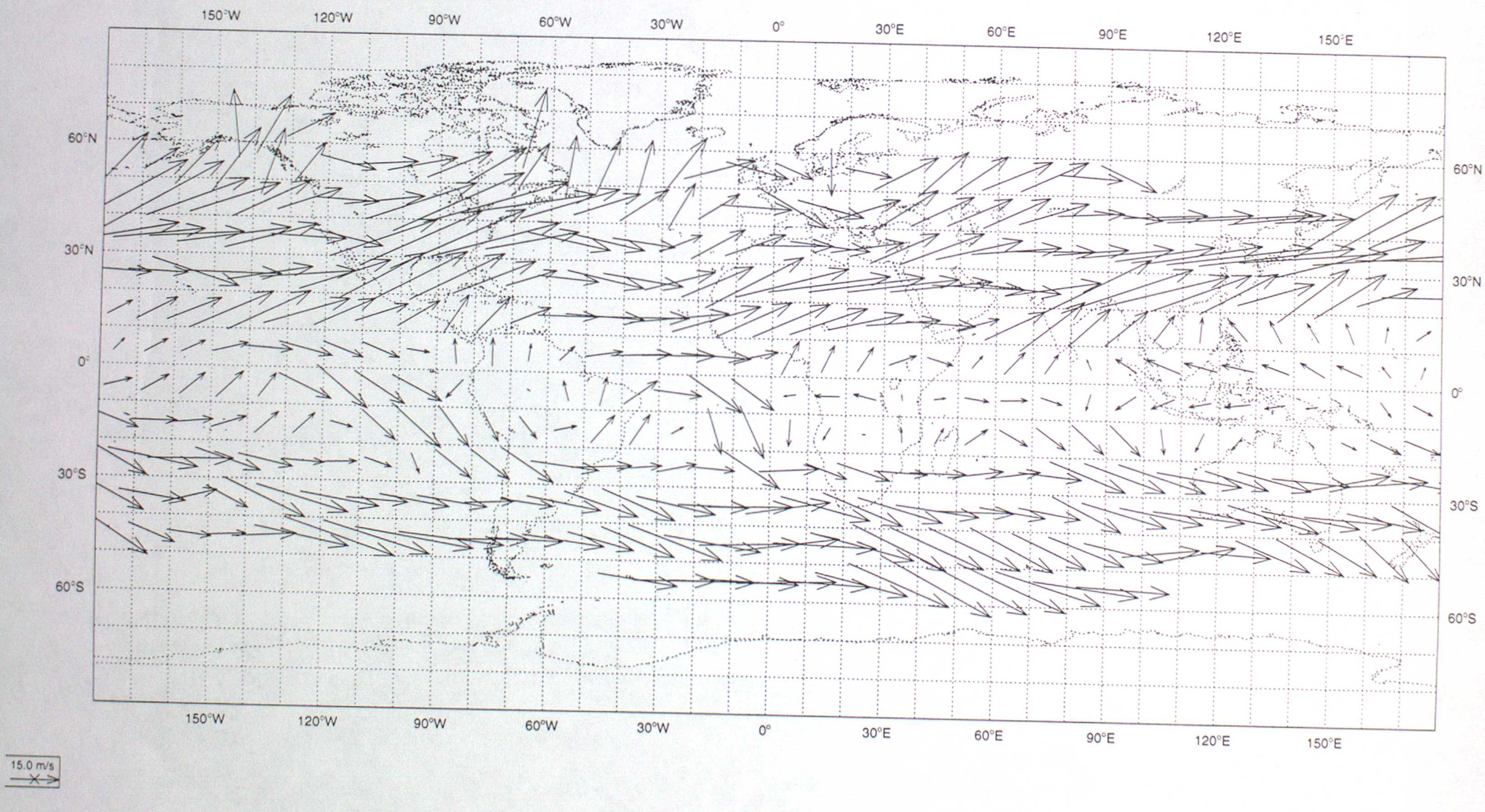


Figure 22. SATOB 101 - 400 hPa vector wind differences. DECEMBER 2001
All observations
Arrows are plotted where greater than 10 obs are present

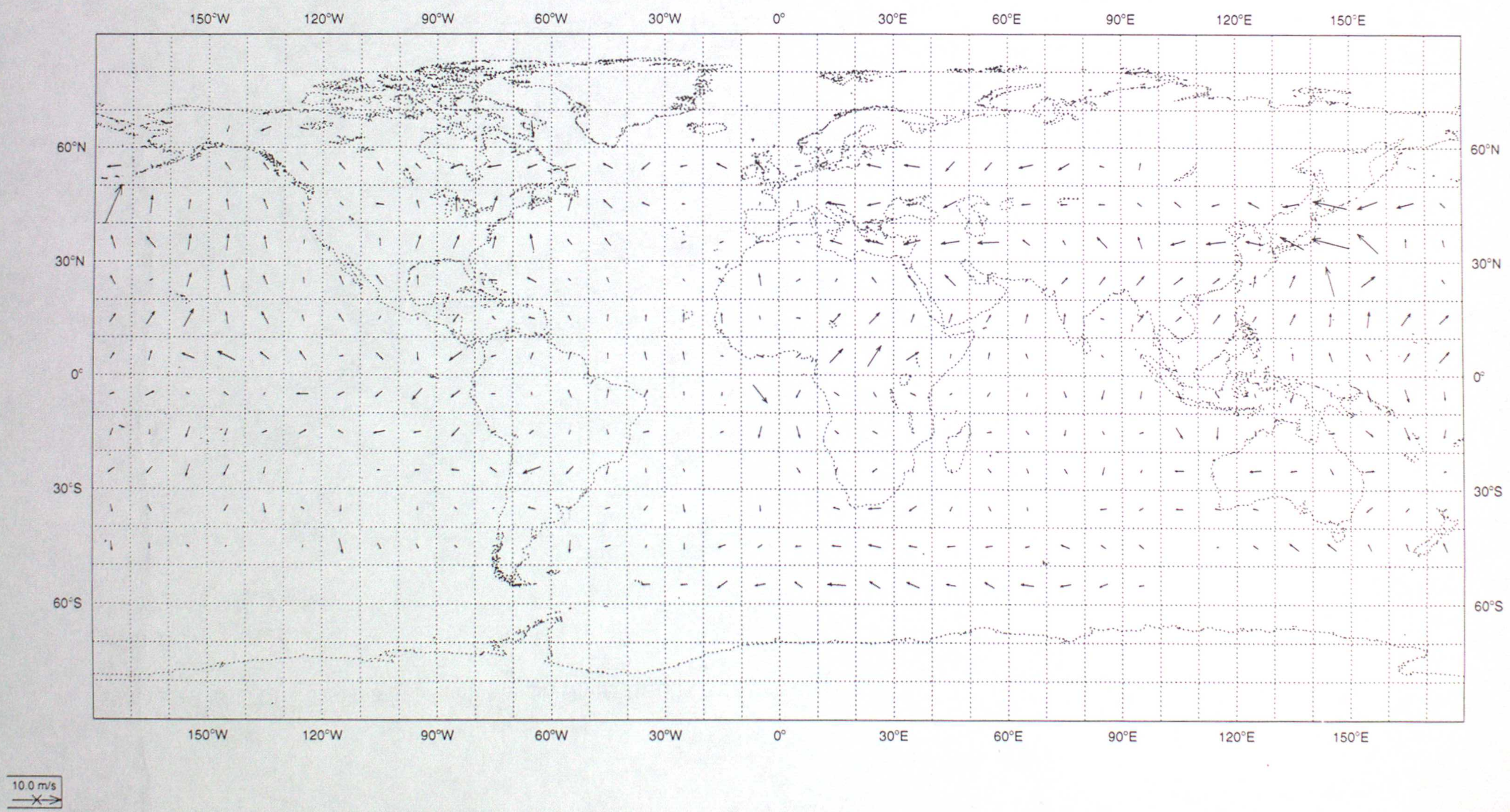


Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). DECEMBER 2001
All observations
Values are plotted where greater than 10 obs are present

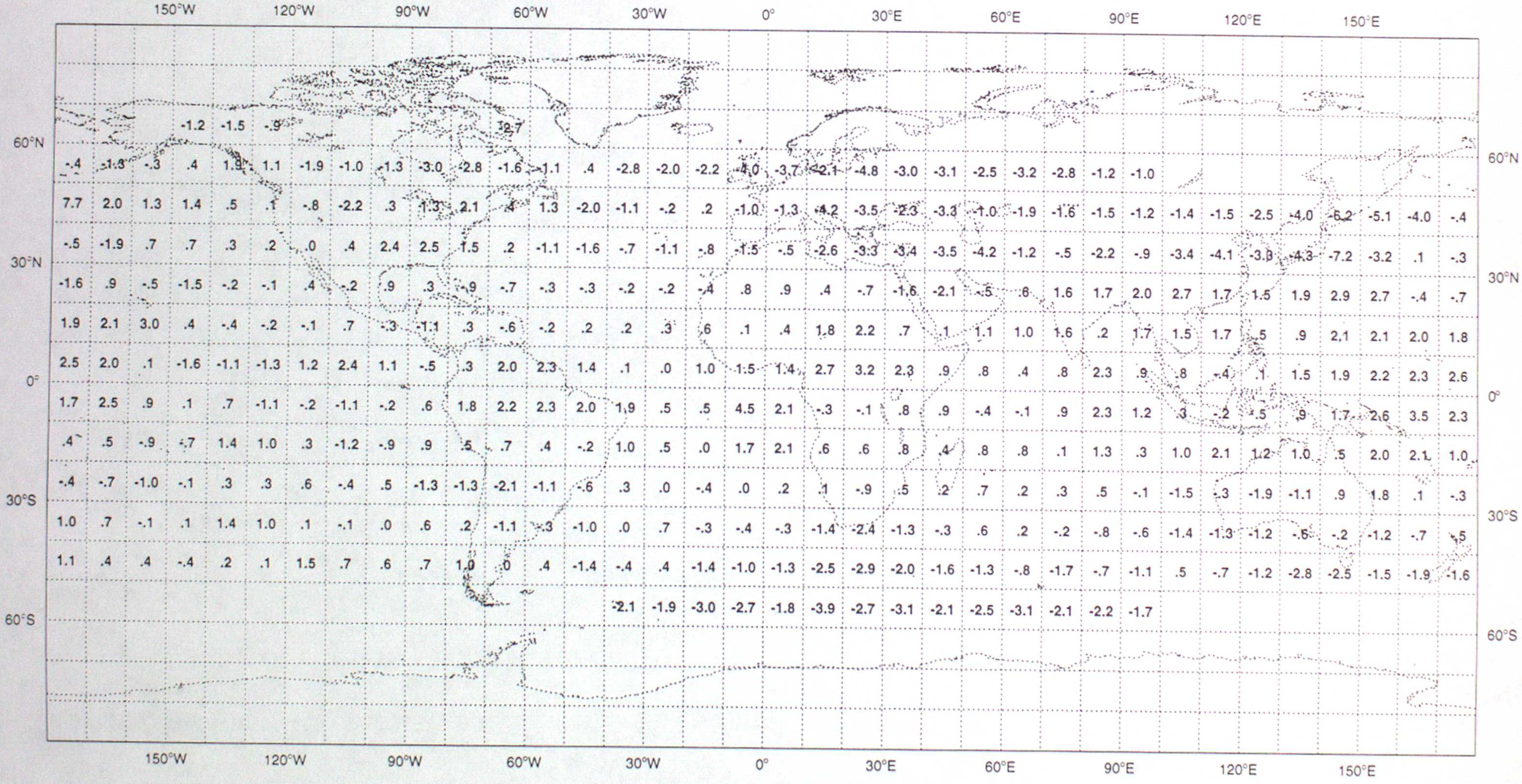
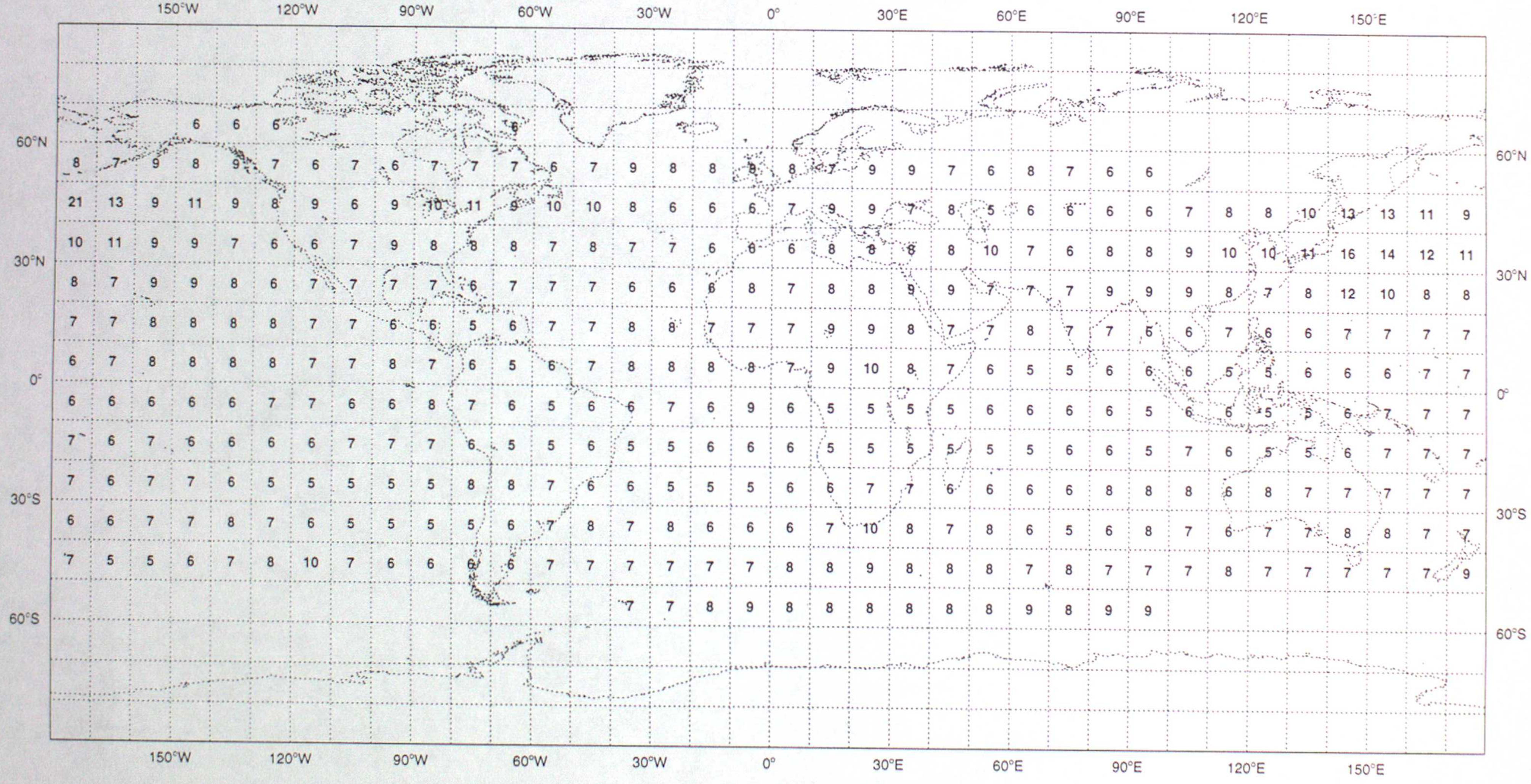


Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). DECEMBER 2001
All observations
Values are plotted where greater than 10 obs are present



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: December 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

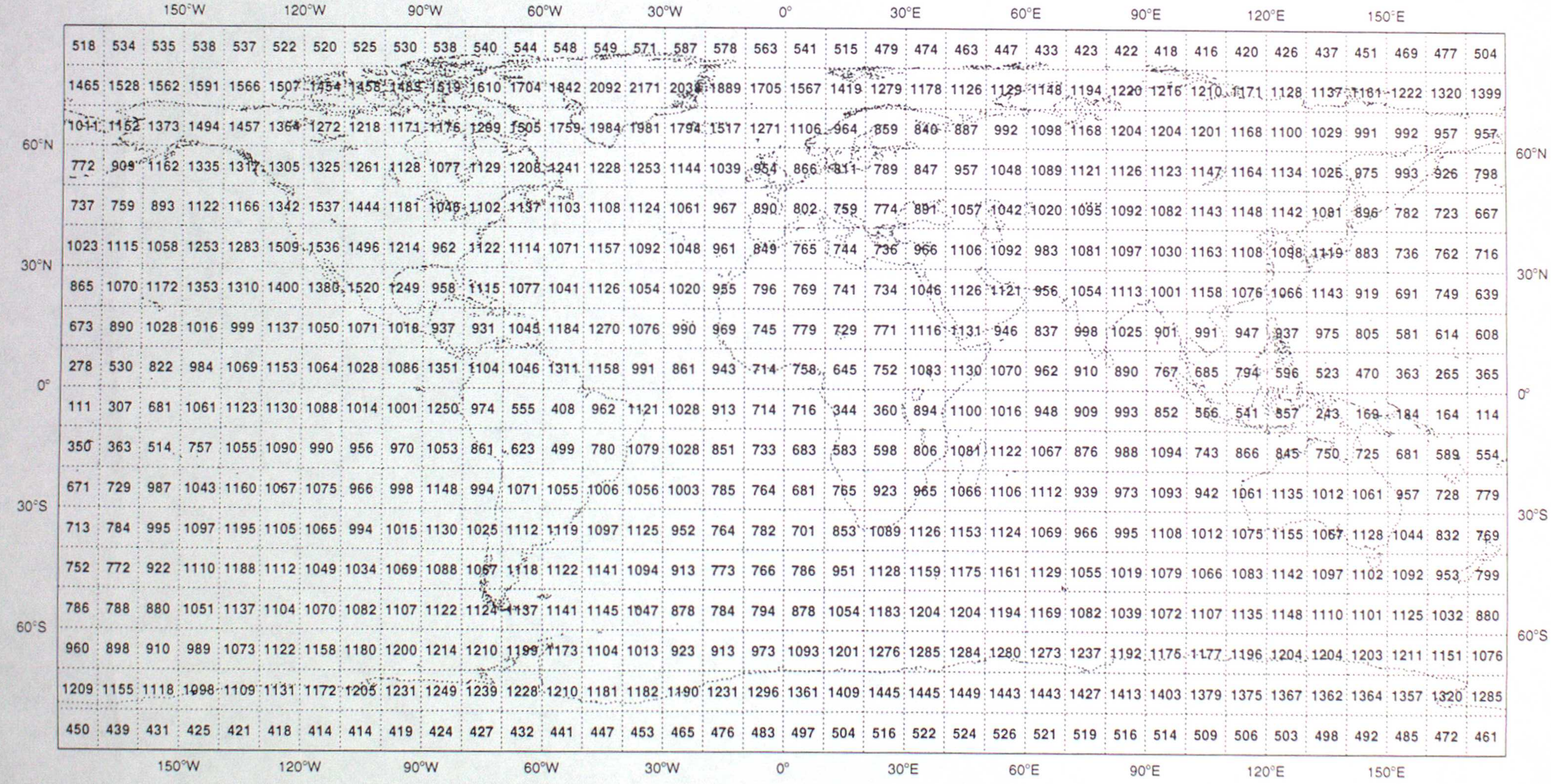
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

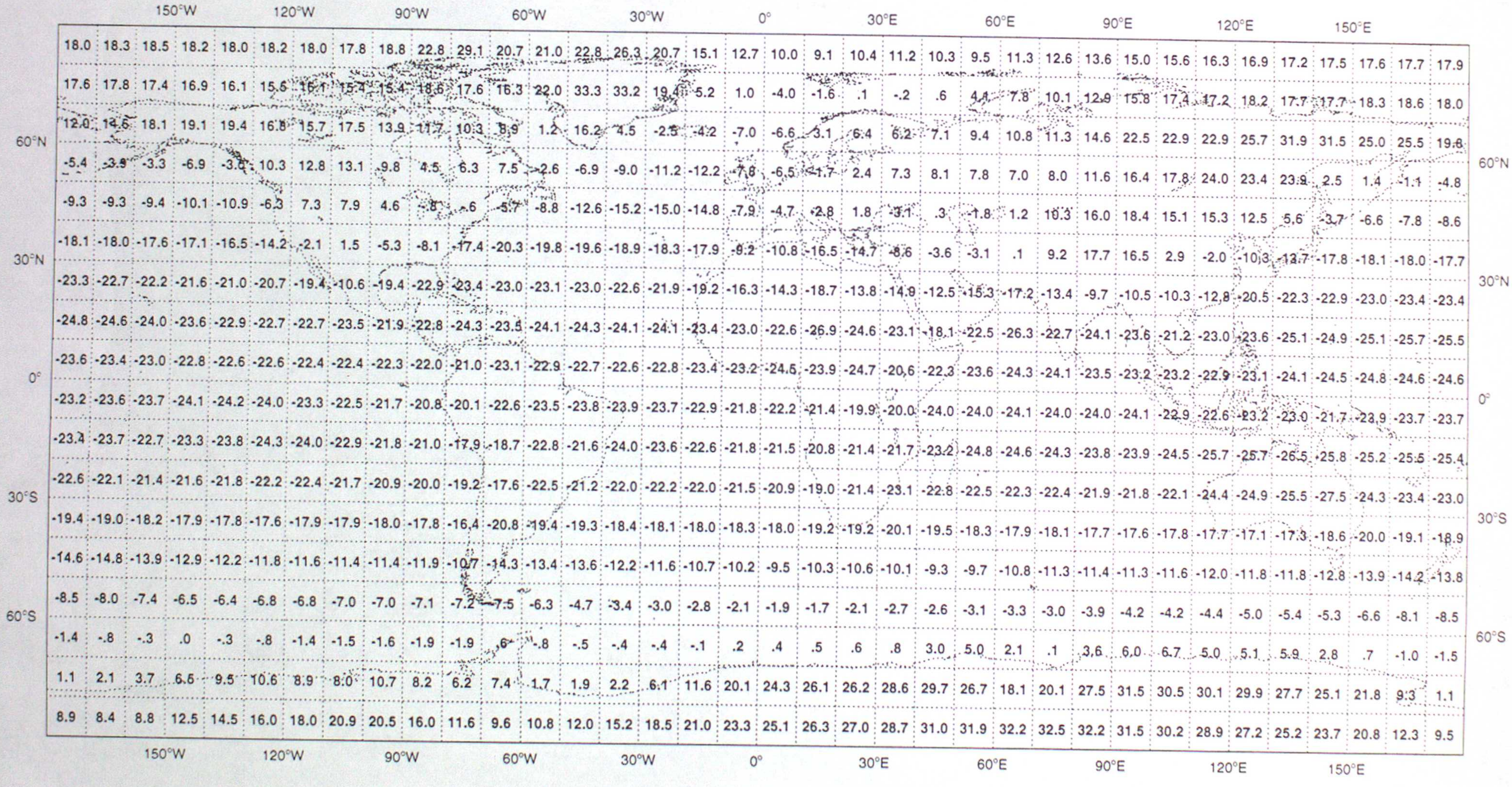
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. DECEMBER 2001
NOAA15, using all observations
Global average number of observations in 24 hours = 636059



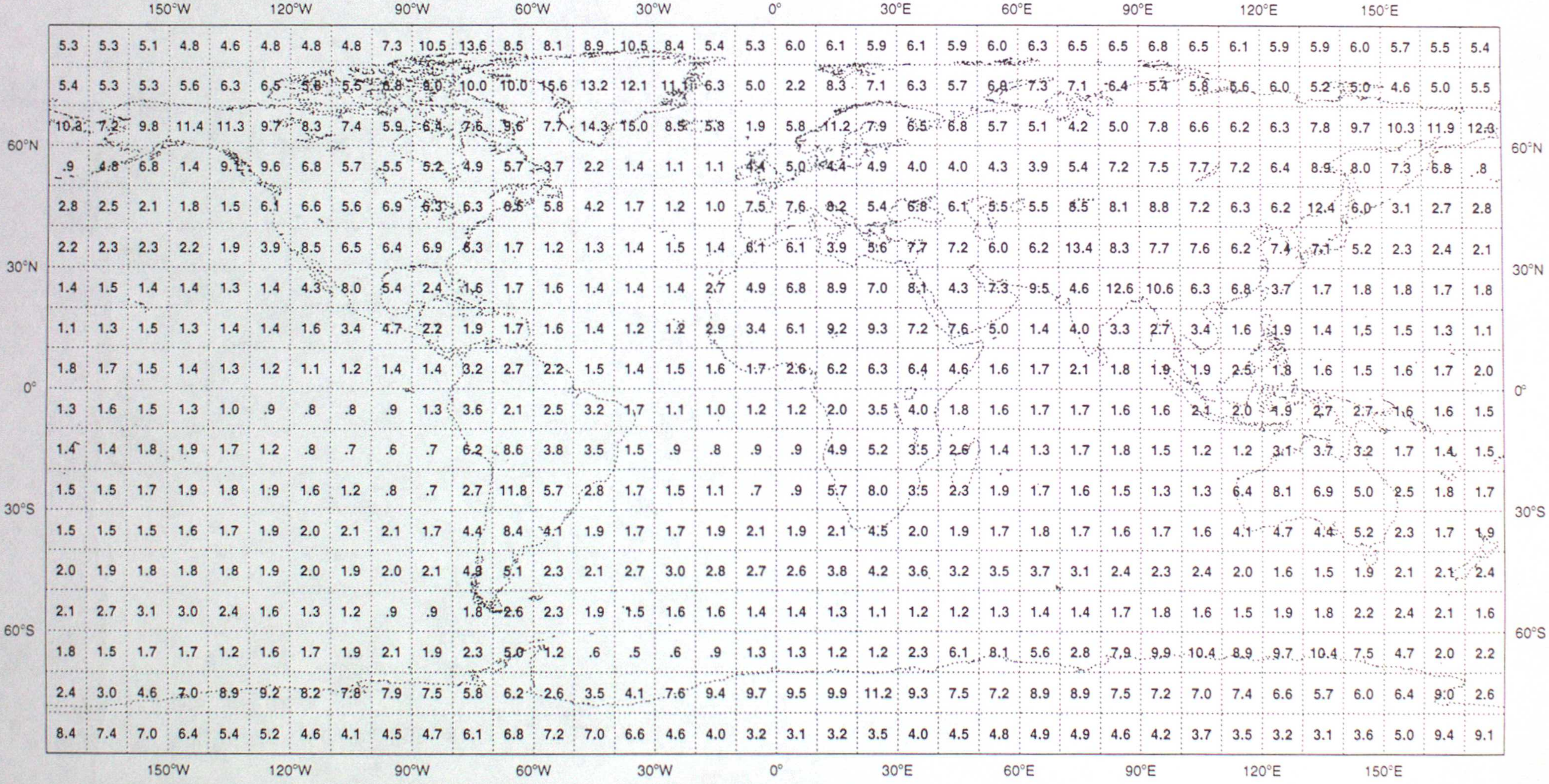
518	534	535	538	537	522	520	525	530	538	540	544	548	549	571	587	578	563	541	515	479	474	463	447	433	423	422	418	416	420	426	437	451	469	477	504
1465	1528	1562	1591	1566	1507	1454	1458	1485	1519	1610	1704	1842	2092	2171	2038	1889	1705	1567	1419	1279	1178	1126	1129	1148	1194	1220	1216	1210	1171	1128	1137	1161	1222	1320	1399
1011	1152	1373	1494	1457	1364	1272	1218	1171	1176	1289	1505	1759	1984	1981	1794	1517	1271	1106	964	859	840	887	992	1098	1168	1204	1204	1201	1168	1100	1029	991	992	957	957
772	909	1162	1335	1317	1305	1325	1261	1128	1077	1129	1208	1241	1228	1253	1144	1039	954	866	811	789	847	957	1048	1089	1121	1126	1123	1147	1164	1134	1026	975	993	926	798
737	759	893	1122	1166	1342	1537	1444	1181	1046	1102	1137	1103	1108	1124	1061	967	890	802	759	774	891	1057	1042	1020	1095	1092	1082	1143	1148	1142	1081	896	782	723	667
1023	1115	1058	1253	1283	1509	1536	1496	1214	962	1122	1114	1071	1157	1092	1048	961	849	765	744	736	966	1106	1092	983	1081	1097	1030	1163	1108	1098	1119	883	736	762	716
865	1070	1172	1353	1310	1400	1380	1520	1249	958	1115	1077	1041	1126	1054	1020	955	796	769	741	734	1046	1126	1121	956	1054	1113	1001	1158	1076	1066	1143	919	691	749	639
673	890	1028	1016	999	1137	1050	1071	1018	937	931	1045	1184	1270	1076	990	969	745	779	729	771	1116	1131	946	837	998	1025	901	991	947	937	975	805	581	614	608
278	530	822	984	1069	1153	1064	1028	1086	1351	1104	1046	1311	1158	991	861	943	714	758	645	752	1083	1130	1070	962	910	890	767	685	794	596	523	470	363	265	365
111	307	681	1061	1123	1130	1088	1014	1001	1250	974	555	408	962	1121	1028	913	714	716	344	360	894	1100	1016	948	909	993	852	566	541	857	243	169	184	164	114
350	363	514	757	1055	1090	990	956	970	1053	861	623	499	780	1079	1028	851	733	683	583	598	806	1081	1122	1067	876	988	1094	743	866	845	750	725	681	589	554
671	729	987	1043	1160	1067	1075	966	998	1148	994	1071	1055	1006	1056	1003	785	764	681	765	923	965	1066	1106	1112	939	973	1093	942	1061	1135	1012	1061	957	728	779
713	784	995	1097	1195	1105	1065	994	1015	1130	1025	1112	1119	1097	1125	952	764	782	701	853	1089	1126	1153	1124	1069	966	995	1108	1012	1075	1155	1067	1128	1044	832	769
752	772	922	1110	1188	1112	1049	1034	1069	1088	1067	1118	1122	1141	1094	913	773	766	786	951	1128	1159	1175	1161	1129	1055	1019	1079	1066	1083	1142	1097	1102	1092	953	799
786	788	880	1051	1137	1104	1070	1082	1107	1122	1124	1137	1141	1145	1047	878	784	794	878	1054	1183	1204	1204	1194	1169	1082	1039	1072	1107	1135	1148	1110	1101	1125	1032	880
960	898	910	989	1073	1122	1158	1180	1200	1214	1210	1199	1173	1104	1013	923	913	973	1093	1201	1276	1285	1284	1280	1273	1237	1192	1176	1177	1196	1204	1204	1203	1211	1151	1076
1209	1155	1118	1098	1109	1131	1172	1205	1231	1249	1239	1228	1210	1181	1182	1190	1231	1296	1361	1409	1445	1445	1449	1443	1443	1427	1413	1403	1379	1375	1367	1362	1364	1357	1320	1285
450	439	431	425	421	418	414	414	419	424	427	432	441	447	453	465	476	483	497	504	516	522	524	526	521	519	516	514	509	506	503	498	492	485	472	461

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS8 (Surface)
NOAA15, using all observations



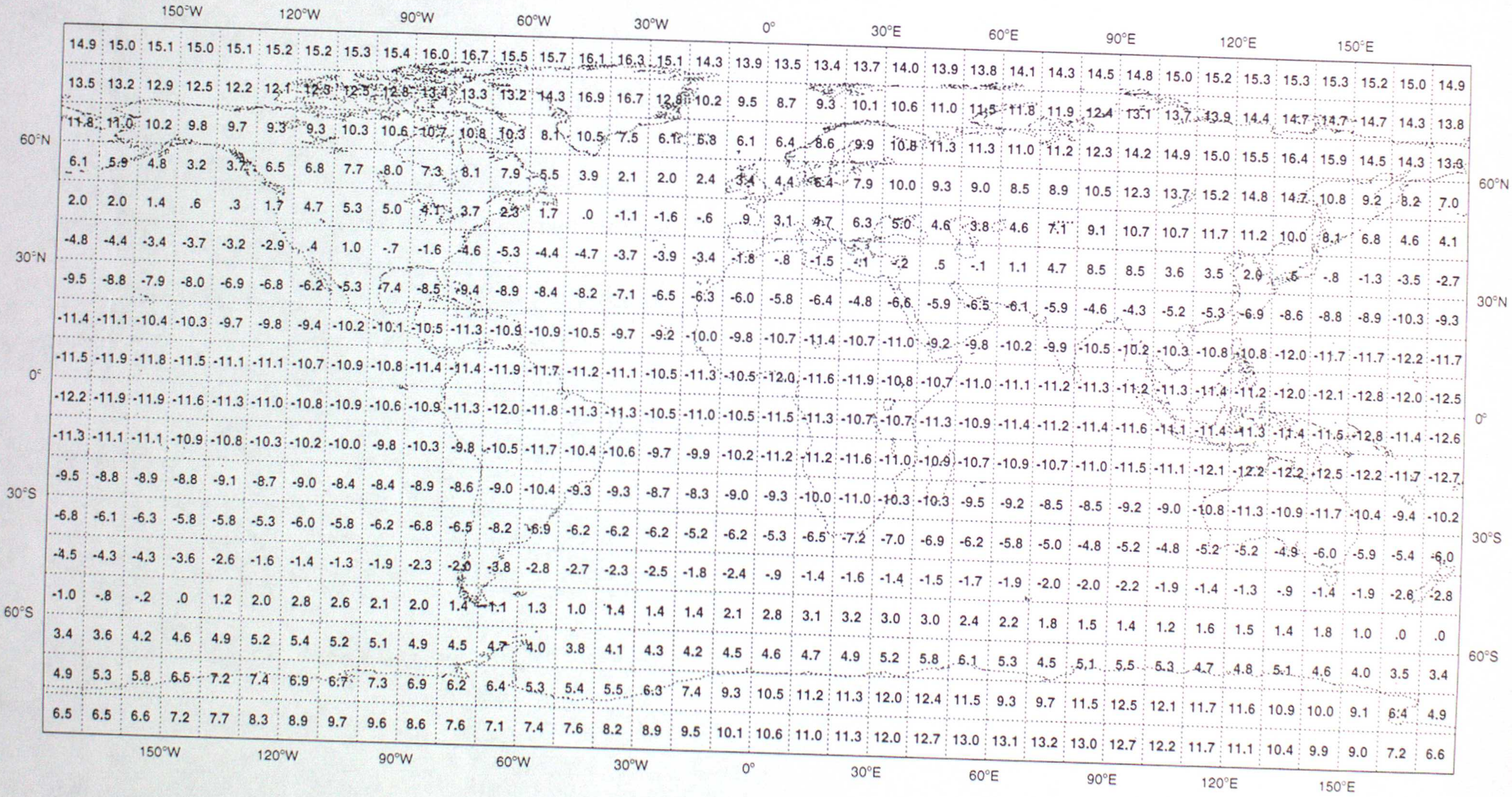
18.0	18.3	18.5	18.2	18.0	18.2	18.0	17.8	18.8	22.8	29.1	20.7	21.0	22.8	26.3	20.7	15.1	12.7	10.0	9.1	10.4	11.2	10.3	9.5	11.3	12.6	13.6	15.0	15.6	16.3	16.9	17.2	17.5	17.6	17.7	17.9
17.6	17.8	17.4	16.9	16.1	15.6	16.1	15.4	15.4	18.6	17.6	16.3	22.0	33.3	33.2	19.4	-5.2	1.0	-4.0	-1.6	.1	-.2	.6	4.4	7.8	10.1	12.9	15.8	17.4	17.2	18.2	17.7	17.7	18.3	18.6	18.0
12.0	14.6	18.1	19.1	19.4	16.8	15.7	17.5	13.9	11.7	10.3	8.9	1.2	16.2	4.5	-2.5	-4.2	-7.0	-6.6	-3.1	6.4	6.2	7.1	9.4	10.8	11.3	14.6	22.5	22.9	22.9	25.7	31.9	31.5	25.0	25.5	19.8
-5.4	-3.9	-3.3	-6.9	-3.6	10.3	12.8	13.1	9.8	4.5	6.3	7.5	-2.6	-6.9	-9.0	-11.2	-12.2	-7.8	-6.5	-1.7	2.4	7.3	8.1	7.8	7.0	8.0	11.6	16.4	17.8	24.0	23.4	23.9	2.5	1.4	-1.1	-4.8
-9.3	-9.3	-9.4	-10.1	-10.9	-6.3	7.3	7.9	4.6	-.8	-.6	-5.7	-8.8	-12.6	-15.2	-15.0	-14.8	-7.9	-4.7	-2.8	1.8	-3.1	.3	-1.8	1.2	10.3	16.0	18.4	15.1	15.3	12.5	5.6	-3.7	-6.6	-7.8	-8.6
-18.1	-18.0	-17.6	-17.1	-16.5	-14.2	-2.1	1.5	-5.3	-8.1	-17.4	-20.3	-19.8	-19.6	-18.9	-18.3	-17.9	-9.2	-10.8	-16.5	-14.7	-8.6	-3.6	-3.1	.1	9.2	17.7	16.5	2.9	-2.0	-10.3	-13.7	-17.8	-18.1	-18.0	-17.7
-23.3	-22.7	-22.2	-21.6	-21.0	-20.7	-19.4	-10.6	-19.4	-22.9	-23.4	-23.0	-23.1	-23.0	-22.6	-21.9	-19.2	-16.3	-14.3	-18.7	-13.8	-14.9	-12.5	-15.3	-17.2	-13.4	-9.7	-10.5	-10.3	-12.8	-20.5	-22.3	-22.9	-23.0	-23.4	-23.4
-24.8	-24.6	-24.0	-23.6	-22.9	-22.7	-22.7	-23.5	-21.9	-22.8	-24.3	-23.5	-24.1	-24.3	-24.1	-24.1	-23.4	-23.0	-22.6	-26.9	-24.6	-23.1	-18.1	-22.5	-26.3	-22.7	-24.1	-23.6	-21.2	-23.0	-23.6	-25.1	-24.9	-25.1	-25.7	-25.5
-23.6	-23.4	-23.0	-22.8	-22.6	-22.6	-22.4	-22.4	-22.3	-22.0	-21.0	-23.1	-22.9	-22.7	-22.6	-22.8	-23.4	-23.2	-24.5	-23.9	-24.7	-20.6	-22.3	-23.6	-24.3	-24.1	-23.5	-23.2	-23.2	-22.9	-23.1	-24.1	-24.5	-24.8	-24.6	-24.6
-23.2	-23.6	-23.7	-24.1	-24.2	-24.0	-23.3	-22.5	-21.7	-20.8	-20.1	-22.6	-23.5	-23.8	-23.9	-23.7	-22.9	-21.8	-22.2	-21.4	-19.9	-20.0	-24.0	-24.0	-24.1	-24.0	-24.0	-24.1	-22.9	-22.6	-23.2	-23.0	-21.7	-23.9	-23.7	-23.7
-23.4	-23.7	-22.7	-23.3	-23.8	-24.3	-24.0	-22.9	-21.8	-21.0	-17.9	-18.7	-22.8	-21.6	-24.0	-23.6	-22.6	-21.8	-21.5	-20.8	-21.4	-21.7	-23.2	-24.8	-24.6	-24.3	-23.8	-23.9	-24.5	-25.7	-25.7	-26.5	-25.8	-25.2	-25.5	-25.4
-22.6	-22.1	-21.4	-21.6	-21.8	-22.2	-22.4	-21.7	-20.9	-20.0	-19.2	-17.6	-22.5	-21.2	-22.0	-22.2	-22.0	-21.5	-20.9	-19.0	-21.4	-23.1	-22.8	-22.5	-22.3	-22.4	-21.9	-21.8	-22.1	-24.4	-24.9	-25.5	-27.5	-24.3	-23.4	-23.0
-19.4	-19.0	-18.2	-17.9	-17.8	-17.6	-17.9	-17.9	-18.0	-17.8	-16.4	-20.8	-19.4	-19.3	-18.4	-18.1	-18.0	-18.3	-18.0	-19.2	-19.2	-20.1	-19.5	-18.3	-17.9	-18.1	-17.7	-17.6	-17.8	-17.7	-17.1	-17.3	-18.6	-20.0	-19.1	-18.9
-14.6	-14.8	-13.9	-12.9	-12.2	-11.8	-11.6	-11.4	-11.4	-11.9	-10.7	-14.3	-13.4	-13.6	-12.2	-11.6	-10.7	-10.2	-9.5	-10.3	-10.6	-10.1	-9.3	-9.7	-10.8	-11.3	-11.4	-11.3	-11.6	-12.0	-11.8	-11.8	-12.8	-13.9	-14.2	-13.8
-8.5	-8.0	-7.4	-6.5	-6.4	-6.8	-6.8	-7.0	-7.0	-7.1	-7.2	-7.5	-6.3	-4.7	-3.4	-3.0	-2.8	-2.1	-1.9	-1.7	-2.1	-2.7	-2.6	-3.1	-3.3	-3.0	-3.9	-4.2	-4.2	-4.4	-5.0	-5.4	-5.3	-6.6	-8.1	-8.5
-1.4	-.8	-.3	.0	-.3	-.8	-1.4	-1.5	-1.6	-1.9	-1.9	.6	-.8	-.5	-.4	-.4	-.1	.2	.4	.5	.6	.8	3.0	5.0	2.1	.1	3.6	6.0	6.7	5.0	5.1	5.9	2.8	.7	-1.0	-1.5
1.1	2.1	3.7	6.5	9.5	10.6	8.9	8.0	10.7	8.2	6.2	7.4	1.7	1.9	2.2	6.1	11.6	20.1	24.3	26.1	26.2	28.6	29.7	26.7	18.1	20.1	27.5	31.5	30.5	30.1	29.9	27.7	25.1	21.8	9.3	1.1
8.9	8.4	8.8	12.5	14.5	16.0	18.0	20.9	20.5	16.0	11.6	9.6	10.8	12.0	15.2	18.5	21.0	23.3	25.1	26.3	27.0	28.7	31.0	31.9	32.2	32.5	32.2	31.5	30.2	28.9	27.2	25.2	23.7	20.8	12.3	9.5

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS8 (Surface)
NOAA15, using all observations



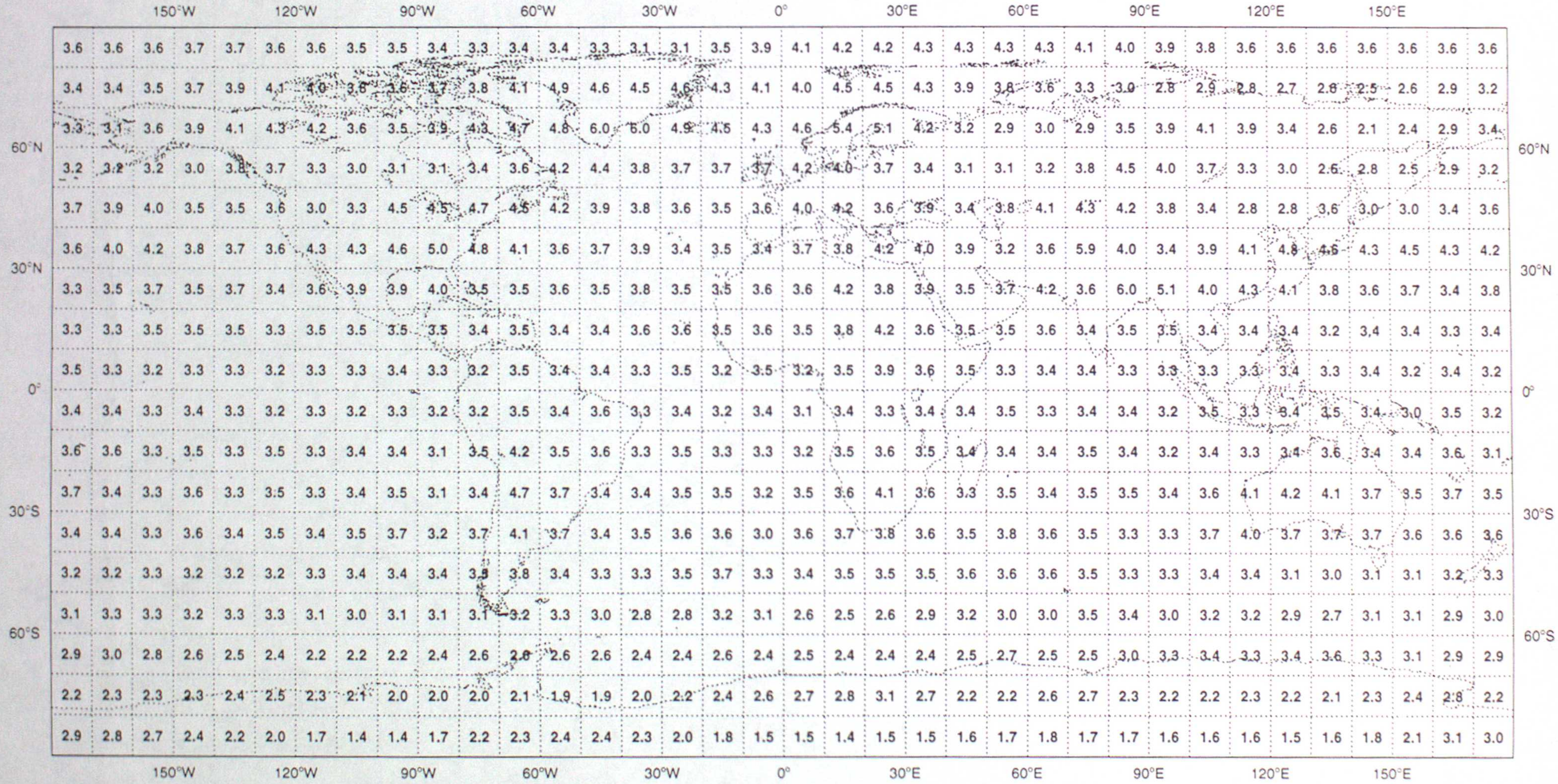
5.3	5.3	5.1	4.8	4.6	4.8	4.8	4.8	7.3	10.5	13.6	8.5	8.1	8.9	10.5	8.4	5.4	5.3	6.0	6.1	5.9	6.1	5.9	6.0	6.3	6.5	6.5	6.8	6.5	6.1	5.9	5.9	6.0	5.7	5.5	5.4
5.4	5.3	5.3	5.6	6.3	6.5	5.8	5.5	6.8	9.0	10.0	10.0	15.6	13.2	12.1	11.1	6.3	5.0	2.2	8.3	7.1	6.3	5.7	6.8	7.3	7.1	6.4	5.4	5.8	5.6	6.0	5.2	5.0	4.6	5.0	5.5
10.8	7.2	9.8	11.4	11.3	9.7	8.3	7.4	5.9	6.4	7.6	9.6	7.7	14.3	15.0	8.5	5.8	1.9	5.8	11.2	7.9	6.5	6.8	5.7	5.1	4.2	5.0	7.8	6.6	6.2	6.3	7.8	9.7	10.3	11.9	12.8
.9	4.8	6.8	1.4	9.1	9.6	6.8	5.7	5.5	5.2	4.9	5.7	3.7	2.2	1.4	1.1	1.1	4.4	5.0	4.4	4.9	4.0	4.0	4.3	3.9	5.4	7.2	7.5	7.7	7.2	6.4	8.9	8.0	7.3	6.8	.8
2.8	2.5	2.1	1.8	1.5	6.1	6.6	5.6	6.9	6.3	6.3	6.5	5.8	4.2	1.7	1.2	1.0	7.5	7.6	8.2	5.4	6.8	6.1	5.5	5.5	8.5	8.1	8.8	7.2	6.3	6.2	12.4	6.0	3.1	2.7	2.8
2.2	2.3	2.3	2.2	1.9	3.9	8.5	6.5	6.4	6.9	6.3	1.7	1.2	1.3	1.4	1.5	1.4	6.1	6.1	3.9	5.6	7.7	7.2	6.0	6.2	13.4	8.3	7.7	7.6	6.2	7.4	7.1	5.2	2.3	2.4	2.1
1.4	1.5	1.4	1.4	1.3	1.4	4.3	8.0	5.4	2.4	1.6	1.7	1.6	1.4	1.4	1.4	2.7	4.9	6.8	8.9	7.0	8.1	4.3	7.3	9.5	4.6	12.6	10.6	6.3	6.8	3.7	1.7	1.8	1.8	1.7	1.8
1.1	1.3	1.5	1.3	1.4	1.4	1.6	3.4	4.7	2.2	1.9	1.7	1.6	1.4	1.2	1.2	2.9	3.4	6.1	9.2	9.3	7.2	7.6	5.0	1.4	4.0	3.3	2.7	3.4	1.6	1.9	1.4	1.5	1.5	1.3	1.1
1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.2	1.4	1.4	3.2	2.7	2.2	1.5	1.4	1.5	1.6	1.7	2.6	6.2	6.3	6.4	4.6	1.6	1.7	2.1	1.8	1.9	1.9	2.5	1.8	1.6	1.5	1.6	1.7	2.0
1.3	1.6	1.5	1.3	1.0	.9	.8	.8	.9	1.3	3.6	2.1	2.5	3.2	1.7	1.1	1.0	1.2	1.2	2.0	3.5	4.0	1.8	1.6	1.7	1.7	1.6	1.6	2.1	2.0	1.9	2.7	2.7	1.6	1.6	1.5
1.4	1.4	1.8	1.9	1.7	1.2	.8	.7	.6	.7	6.2	8.6	3.8	3.5	1.5	.9	.8	.9	.9	4.9	5.2	3.5	2.6	1.4	1.3	1.7	1.8	1.5	1.2	1.2	3.1	3.7	3.2	1.7	1.4	1.5
1.5	1.5	1.7	1.9	1.8	1.9	1.6	1.2	.8	.7	2.7	11.8	5.7	2.8	1.7	1.5	1.1	.7	.9	5.7	8.0	3.5	2.3	1.9	1.7	1.6	1.5	1.3	1.3	6.4	8.1	6.9	5.0	2.5	1.8	1.7
1.5	1.5	1.5	1.6	1.7	1.9	2.0	2.1	2.1	1.7	4.4	8.4	4.1	1.9	1.7	1.7	1.9	2.1	1.9	2.1	4.5	2.0	1.9	1.7	1.8	1.7	1.6	1.7	1.6	4.1	4.7	4.4	5.2	2.3	1.7	1.9
2.0	1.9	1.8	1.8	1.8	1.9	2.0	1.9	2.0	2.1	4.9	5.1	2.3	2.1	2.7	3.0	2.8	2.7	2.6	3.8	4.2	3.6	3.2	3.5	3.7	3.1	2.4	2.3	2.4	2.0	1.6	1.5	1.9	2.1	2.1	2.4
2.1	2.7	3.1	3.0	2.4	1.6	1.3	1.2	.9	.9	1.8	2.6	2.3	1.9	1.5	1.6	1.6	1.4	1.4	1.3	1.1	1.2	1.2	1.3	1.4	1.4	1.7	1.8	1.6	1.5	1.9	1.8	2.2	2.4	2.1	1.6
1.8	1.5	1.7	1.7	1.2	1.6	1.7	1.9	2.1	1.9	2.3	5.0	1.2	.6	.5	.6	.9	1.3	1.3	1.2	1.2	2.3	6.1	8.1	5.6	2.8	7.9	9.9	10.4	8.9	9.7	10.4	7.5	4.7	2.0	2.2
2.4	3.0	4.6	7.0	8.9	9.2	8.2	7.8	7.9	7.5	5.8	6.2	2.6	3.5	4.1	7.6	9.4	9.7	9.5	9.9	11.2	9.3	7.5	7.2	8.9	8.9	7.5	7.2	7.0	7.4	6.6	5.7	6.0	6.4	9.0	2.6
8.4	7.4	7.0	6.4	5.4	5.2	4.6	4.1	4.5	4.7	6.1	6.8	7.2	7.0	6.6	4.6	4.0	3.2	3.1	3.2	3.5	4.0	4.5	4.8	4.9	4.9	4.6	4.2	3.7	3.5	3.2	3.1	3.6	5.0	9.4	9.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



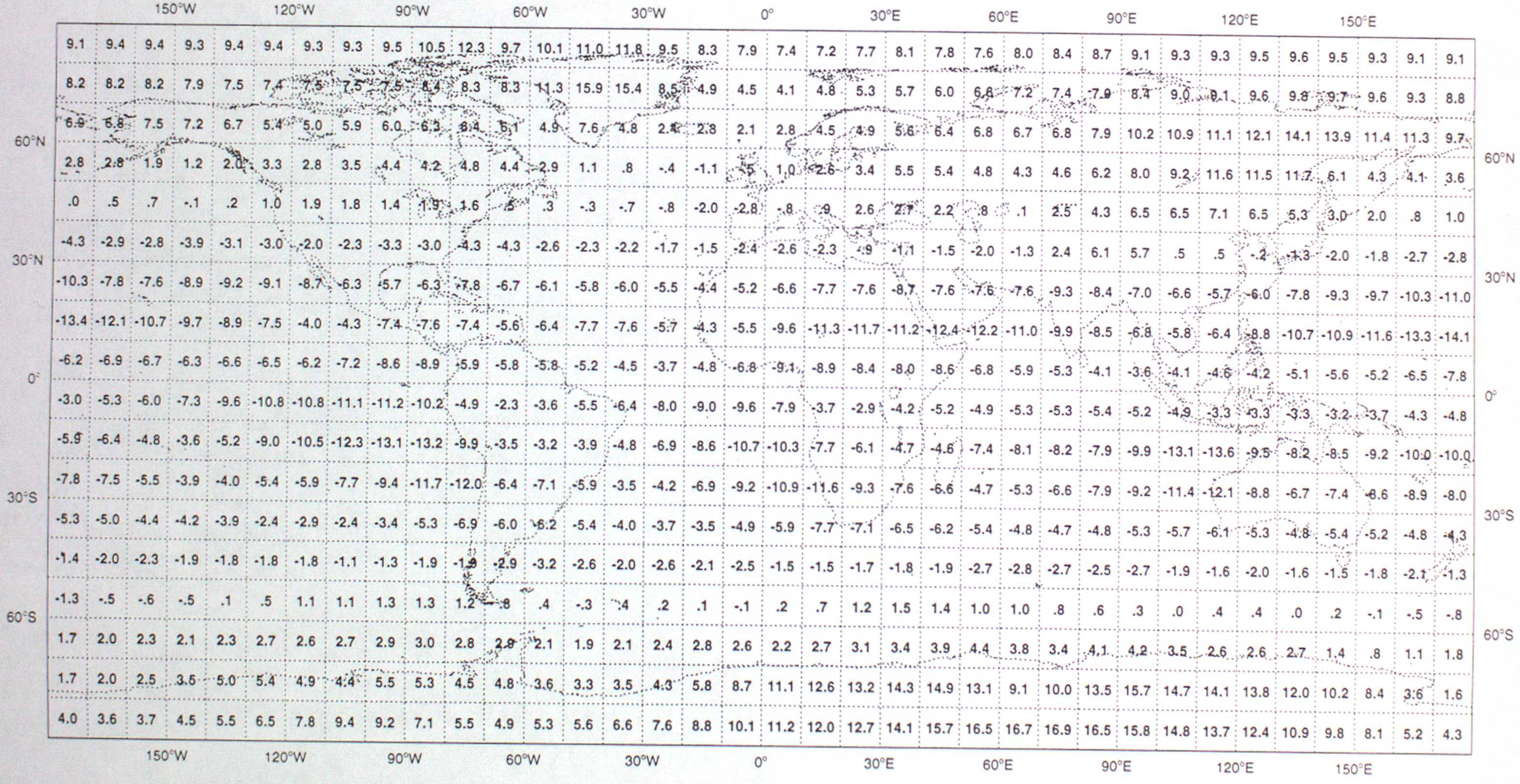
14.9	15.0	15.1	15.0	15.1	15.2	15.2	15.3	15.4	16.0	16.7	15.5	15.7	16.1	16.3	15.1	14.3	13.9	13.5	13.4	13.7	14.0	13.9	13.8	14.1	14.3	14.5	14.8	15.0	15.2	15.3	15.3	15.3	15.2	15.0	14.9
13.5	13.2	12.9	12.5	12.2	12.1	12.5	12.5	12.8	13.4	13.3	13.2	14.3	16.9	16.7	12.8	10.2	9.5	8.7	9.3	10.1	10.6	11.0	11.5	11.8	11.9	12.4	13.1	13.7	13.9	14.4	14.7	14.7	14.7	14.3	13.8
11.8	11.0	10.2	9.8	9.7	9.3	9.3	10.3	10.6	10.7	10.8	10.3	8.1	10.5	7.5	6.1	5.8	6.1	6.4	8.6	9.9	10.8	11.3	11.3	11.0	11.2	12.3	14.2	14.9	15.0	15.5	16.4	15.9	14.5	14.3	13.8
6.1	5.9	4.8	3.2	3.7	6.5	6.8	7.7	8.0	7.3	8.1	7.9	5.5	3.9	2.1	2.0	2.4	3.4	4.4	6.4	7.9	10.0	9.3	9.0	8.5	8.9	10.5	12.3	13.7	15.2	14.8	14.7	10.8	9.2	8.2	7.0
2.0	2.0	1.4	.6	.3	1.7	4.7	5.3	5.0	4.1	3.7	2.3	1.7	.0	-1.1	-1.6	-.6	.9	3.1	4.7	6.3	5.0	4.6	3.8	4.6	7.1	9.1	10.7	10.7	11.7	11.2	10.0	8.1	6.8	4.6	4.1
-4.8	-4.4	-3.4	-3.7	-3.2	-2.9	.4	1.0	-.7	-1.6	-4.6	-5.3	-4.4	-4.7	-3.7	-3.9	-3.4	-1.8	-.8	-1.5	-.1	-.2	.5	-.1	1.1	4.7	8.5	8.5	3.6	3.5	2.0	.5	-.8	-1.3	-3.5	-2.7
-9.5	-8.8	-7.9	-8.0	-6.9	-6.8	-6.2	-5.3	-7.4	-8.5	-9.4	-8.9	-8.4	-8.2	-7.1	-6.5	-6.3	-6.0	-5.8	-6.4	-4.8	-6.6	-5.9	-6.5	-6.1	-5.9	-4.6	-4.3	-5.2	-5.3	-6.9	-8.6	-8.8	-8.9	-10.3	-9.3
-11.4	-11.1	-10.4	-10.3	-9.7	-9.8	-9.4	-10.2	-10.1	-10.5	-11.3	-10.9	-10.9	-10.5	-9.7	-9.2	-10.0	-9.8	-10.7	-11.4	-10.7	-11.0	-9.2	-9.8	-10.2	-9.9	-10.5	-10.2	-10.3	-10.8	-10.8	-12.0	-11.7	-11.7	-12.2	-11.7
-11.5	-11.9	-11.8	-11.5	-11.1	-11.1	-10.7	-10.9	-10.8	-11.4	-11.4	-11.9	-11.7	-11.2	-11.1	-10.5	-11.3	-10.5	-12.0	-11.6	-11.9	-10.8	-10.7	-11.0	-11.1	-11.2	-11.3	-11.2	-11.3	-11.4	-11.2	-12.0	-12.1	-12.8	-12.0	-12.5
-12.2	-11.9	-11.9	-11.6	-11.3	-11.0	-10.8	-10.9	-10.6	-10.9	-11.3	-12.0	-11.8	-11.3	-11.3	-10.5	-11.0	-10.5	-11.5	-11.3	-10.7	-10.7	-11.3	-10.9	-11.4	-11.2	-11.4	-11.6	-11.1	-11.4	-11.3	-11.4	-11.5	-12.8	-11.4	-12.6
-11.3	-11.1	-11.1	-10.9	-10.8	-10.3	-10.2	-10.0	-9.8	-10.3	-9.8	-10.5	-11.7	-10.4	-10.6	-9.7	-9.9	-10.2	-11.2	-11.2	-11.6	-11.0	-10.9	-10.7	-10.9	-10.7	-11.0	-11.5	-11.1	-12.1	-12.2	-12.2	-12.5	-12.2	-11.7	-12.7
-9.5	-8.8	-8.9	-8.8	-9.1	-8.7	-9.0	-8.4	-8.4	-8.9	-8.6	-9.0	-10.4	-9.3	-9.3	-8.7	-8.3	-9.0	-9.3	-10.0	-11.0	-10.3	-10.3	-9.5	-9.2	-8.5	-8.5	-9.2	-9.0	-10.8	-11.3	-10.9	-11.7	-10.4	-9.4	-10.2
-6.8	-6.1	-6.3	-5.8	-5.8	-5.3	-6.0	-5.8	-6.2	-6.8	-6.5	-8.2	-6.9	-6.2	-6.2	-6.2	-5.2	-6.2	-5.3	-6.5	-7.2	-7.0	-6.9	-6.2	-5.8	-5.0	-4.8	-5.2	-4.8	-5.2	-5.2	-4.9	-6.0	-5.9	-5.4	-6.0
-4.5	-4.3	-4.3	-3.6	-2.6	-1.6	-1.4	-1.3	-1.9	-2.3	-2.0	-3.8	-2.8	-2.7	-2.3	-2.5	-1.8	-2.4	-.9	-1.4	-1.6	-1.4	-1.5	-1.7	-1.9	-2.0	-2.0	-2.2	-1.9	-1.4	-1.3	-.9	-1.4	-1.9	-2.6	-2.8
-1.0	-.8	-.2	.0	1.2	2.0	2.8	2.6	2.1	2.0	1.4	1.1	1.3	1.0	1.4	1.4	1.4	2.1	2.8	3.1	3.2	3.0	3.0	2.4	2.2	1.8	1.5	1.4	1.2	1.6	1.5	1.4	1.8	1.0	.0	.0
3.4	3.6	4.2	4.6	4.9	5.2	5.4	5.2	5.1	4.9	4.5	4.7	4.0	3.8	4.1	4.3	4.2	4.5	4.6	4.7	4.9	5.2	5.8	6.1	5.3	4.5	5.1	5.5	5.3	4.7	4.8	5.1	4.6	4.0	3.5	3.4
4.9	5.3	5.8	6.5	7.2	7.4	6.9	6.7	7.3	6.9	6.2	6.4	5.3	5.4	5.5	6.3	7.4	9.3	10.5	11.2	11.3	12.0	12.4	11.5	9.3	9.7	11.5	12.5	12.1	11.7	11.6	10.9	10.0	9.1	6.4	4.9
6.5	6.5	6.6	7.2	7.7	8.3	8.9	9.7	9.6	8.6	7.6	7.1	7.4	7.6	8.2	8.9	9.5	10.1	10.6	11.0	11.3	12.0	12.7	13.0	13.1	13.2	13.0	12.7	12.2	11.7	11.1	10.4	9.9	9.0	7.2	6.6

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



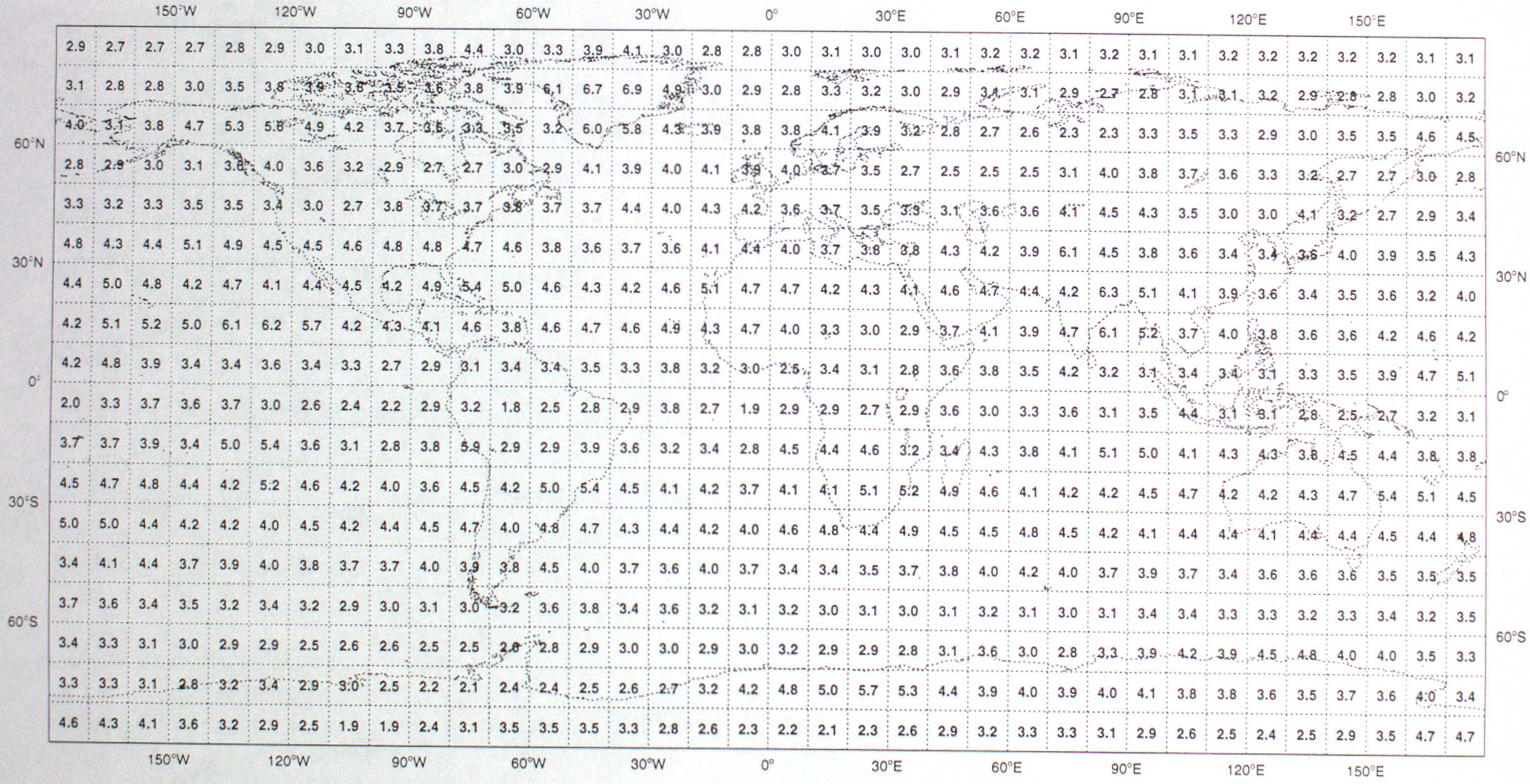
3.6	3.6	3.6	3.7	3.7	3.6	3.6	3.5	3.5	3.4	3.3	3.4	3.4	3.3	3.1	3.1	3.5	3.9	4.1	4.2	4.2	4.3	4.3	4.3	4.3	4.1	4.0	3.9	3.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6
3.4	3.4	3.5	3.7	3.9	4.1	4.0	3.8	3.6	3.7	3.8	4.1	4.9	4.6	4.5	4.6	4.3	4.1	4.0	4.5	4.5	4.3	3.9	3.8	3.6	3.3	3.0	2.8	2.9	2.8	2.7	2.8	2.5	2.6	2.9	3.2
3.3	3.1	3.6	3.9	4.1	4.3	4.2	3.6	3.5	3.9	4.3	4.7	4.8	6.0	6.0	4.9	4.5	4.3	4.6	5.4	5.1	4.2	3.2	2.9	3.0	2.9	3.5	3.9	4.1	3.9	3.4	2.6	2.1	2.4	2.9	3.4
3.2	3.2	3.2	3.0	3.8	3.7	3.3	3.0	3.1	3.1	3.4	3.6	4.2	4.4	3.8	3.7	3.7	3.7	4.2	4.0	3.7	3.4	3.1	3.1	3.2	3.8	4.5	4.0	3.7	3.3	3.0	2.6	2.8	2.5	2.9	3.2
3.7	3.9	4.0	3.5	3.5	3.6	3.0	3.3	4.5	4.5	4.7	4.5	4.2	3.9	3.8	3.6	3.5	3.6	4.0	4.2	3.6	3.9	3.4	3.8	4.1	4.3	4.2	3.8	3.4	2.8	2.8	3.6	3.0	3.0	3.4	3.6
3.6	4.0	4.2	3.8	3.7	3.6	4.3	4.3	4.6	5.0	4.8	4.1	3.6	3.7	3.9	3.4	3.5	3.4	3.7	3.8	4.2	4.0	3.9	3.2	3.6	5.9	4.0	3.4	3.9	4.1	4.8	4.6	4.3	4.5	4.3	4.2
3.3	3.5	3.7	3.5	3.7	3.4	3.6	3.9	3.9	4.0	3.5	3.5	3.6	3.5	3.8	3.5	3.5	3.6	3.6	4.2	3.8	3.9	3.5	3.7	4.2	3.6	6.0	5.1	4.0	4.3	4.1	3.8	3.6	3.7	3.4	3.8
3.3	3.3	3.5	3.5	3.5	3.3	3.5	3.5	3.5	3.5	3.4	3.5	3.4	3.4	3.6	3.6	3.5	3.6	3.5	3.8	4.2	3.6	3.5	3.5	3.6	3.4	3.5	3.5	3.4	3.4	3.4	3.2	3.4	3.4	3.3	3.4
3.5	3.3	3.2	3.3	3.3	3.2	3.3	3.3	3.4	3.3	3.2	3.5	3.4	3.4	3.3	3.5	3.2	3.5	3.2	3.5	3.9	3.6	3.5	3.3	3.4	3.4	3.3	3.3	3.3	3.3	3.4	3.3	3.4	3.2	3.4	3.2
3.4	3.4	3.3	3.4	3.3	3.2	3.3	3.2	3.3	3.2	3.2	3.5	3.4	3.6	3.3	3.4	3.2	3.4	3.1	3.4	3.3	3.4	3.4	3.5	3.3	3.4	3.4	3.2	3.5	3.3	3.4	3.5	3.4	3.0	3.5	3.2
3.6	3.6	3.3	3.5	3.3	3.5	3.3	3.4	3.4	3.1	3.5	4.2	3.5	3.6	3.3	3.5	3.3	3.3	3.2	3.5	3.6	3.5	3.4	3.4	3.4	3.5	3.4	3.2	3.4	3.3	3.4	3.6	3.4	3.4	3.6	3.1
3.7	3.4	3.3	3.6	3.3	3.5	3.3	3.4	3.5	3.1	3.4	4.7	3.7	3.4	3.4	3.5	3.5	3.2	3.5	3.6	4.1	3.6	3.3	3.5	3.4	3.5	3.5	3.4	3.6	4.1	4.2	4.1	3.7	3.5	3.7	3.5
3.4	3.4	3.3	3.6	3.4	3.5	3.4	3.5	3.7	3.2	3.7	4.1	3.7	3.4	3.5	3.6	3.6	3.0	3.6	3.7	3.8	3.6	3.5	3.8	3.6	3.5	3.3	3.3	3.7	4.0	3.7	3.7	3.7	3.6	3.6	3.6
3.2	3.2	3.3	3.2	3.2	3.2	3.3	3.4	3.4	3.4	3.5	3.8	3.4	3.3	3.3	3.5	3.7	3.3	3.4	3.5	3.5	3.5	3.6	3.6	3.6	3.5	3.3	3.3	3.4	3.4	3.1	3.0	3.1	3.1	3.2	3.3
3.1	3.3	3.3	3.2	3.3	3.3	3.1	3.0	3.1	3.1	3.1	3.2	3.3	3.0	2.8	2.8	3.2	3.1	2.6	2.5	2.6	2.9	3.2	3.0	3.0	3.5	3.4	3.0	3.2	3.2	2.9	2.7	3.1	3.1	2.9	3.0
2.9	3.0	2.8	2.6	2.5	2.4	2.2	2.2	2.2	2.4	2.6	2.8	2.6	2.6	2.4	2.4	2.6	2.4	2.5	2.4	2.4	2.4	2.5	2.7	2.5	2.5	3.0	3.3	3.4	3.3	3.4	3.6	3.3	3.1	2.9	2.9
2.2	2.3	2.3	2.3	2.4	2.5	2.3	2.1	2.0	2.0	2.0	2.1	1.9	1.9	2.0	2.2	2.4	2.6	2.7	2.8	3.1	2.7	2.2	2.2	2.6	2.7	2.3	2.2	2.2	2.3	2.2	2.1	2.3	2.4	2.8	2.2
2.9	2.8	2.7	2.4	2.2	2.0	1.7	1.4	1.4	1.7	2.2	2.3	2.4	2.4	2.3	2.0	1.8	1.5	1.5	1.4	1.5	1.5	1.6	1.7	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.6	1.8	2.1	3.1	3.0

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



9.1	9.4	9.4	9.3	9.4	9.4	9.3	9.3	9.5	10.5	12.3	9.7	10.1	11.0	11.8	9.5	8.3	7.9	7.4	7.2	7.7	8.1	7.8	7.6	8.0	8.4	8.7	9.1	9.3	9.3	9.5	9.6	9.5	9.3	9.1	9.1
8.2	8.2	8.2	7.9	7.5	7.4	7.5	7.5	7.5	8.4	8.3	8.3	11.3	15.9	15.4	8.5	4.9	4.5	4.1	4.8	5.3	5.7	6.0	6.6	7.2	7.4	7.9	8.4	9.0	9.1	9.6	9.8	9.7	9.6	9.3	8.8
6.9	6.8	7.5	7.2	6.7	5.4	5.0	5.9	6.0	6.3	8.4	5.1	4.9	7.6	4.8	2.4	2.8	2.1	2.8	4.5	4.9	5.6	6.4	6.8	6.7	6.8	7.9	10.2	10.9	11.1	12.1	14.1	13.9	11.4	11.3	9.7
2.8	2.8	1.9	1.2	2.0	3.3	2.8	3.5	4.4	4.2	4.8	4.4	-2.9	1.1	.8	-.4	-1.1	.5	1.0	2.6	3.4	5.5	5.4	4.8	4.3	4.6	6.2	8.0	9.2	11.6	11.5	11.7	6.1	4.3	4.1	3.6
.0	.5	.7	-.1	.2	1.0	1.9	1.8	1.4	1.9	1.6	.5	.3	-.3	-.7	-.8	-2.0	-2.8	-.8	.9	2.6	2.7	2.2	.8	.1	2.5	4.3	6.5	6.5	7.1	6.5	5.3	3.0	2.0	.8	1.0
-4.3	-2.9	-2.8	-3.9	-3.1	-3.0	-2.0	-2.3	-3.3	-3.0	-4.3	-4.3	-2.6	-2.3	-2.2	-1.7	-1.5	-2.4	-2.6	-2.3	-.9	-1.1	-1.5	-2.0	-1.3	2.4	6.1	5.7	.5	.5	-.2	-1.3	-2.0	-1.8	-2.7	-2.8
-10.3	-7.8	-7.6	-8.9	-9.2	-9.1	-8.7	-6.3	-5.7	-6.3	-7.8	-6.7	-6.1	-5.8	-6.0	-5.5	-4.4	-5.2	-6.6	-7.7	-7.6	-8.7	-7.6	-7.6	-7.6	-9.3	-8.4	-7.0	-6.6	-5.7	-6.0	-7.8	-9.3	-9.7	-10.3	-11.0
-13.4	-12.1	-10.7	-9.7	-8.9	-7.5	-4.0	-4.3	-7.4	-7.6	-7.4	-5.6	-6.4	-7.7	-7.6	-5.7	-4.3	-5.5	-9.6	-11.3	-11.7	-11.2	-12.4	-12.2	-11.0	-9.9	-8.5	-6.8	-5.8	-6.4	-8.8	-10.7	-10.9	-11.6	-13.3	-14.1
-6.2	-6.9	-6.7	-6.3	-6.6	-6.5	-6.2	-7.2	-8.6	-8.9	-5.9	-5.8	-5.8	-5.2	-4.5	-3.7	-4.8	-6.8	-9.1	-8.9	-8.4	-8.0	-8.6	-6.8	-5.9	-5.3	-4.1	-3.6	-4.1	-4.6	-4.2	-5.1	-5.6	-5.2	-6.5	-7.8
-3.0	-5.3	-6.0	-7.3	-9.6	-10.8	-10.8	-11.1	-11.2	-10.2	-4.9	-2.3	-3.6	-5.5	-6.4	-8.0	-9.0	-9.6	-7.9	-3.7	-2.9	-4.2	-5.2	-4.9	-5.3	-5.3	-5.4	-5.2	-4.9	-3.3	-3.3	-3.3	-3.2	-3.7	-4.3	-4.8
-5.9	-6.4	-4.8	-3.6	-5.2	-9.0	-10.5	-12.3	-13.1	-13.2	-9.9	-3.5	-3.2	-3.9	-4.8	-6.9	-8.6	-10.7	-10.3	-7.7	-6.1	-4.7	-4.6	-7.4	-8.1	-8.2	-7.9	-9.9	-13.1	-13.6	-9.5	-8.2	-8.5	-9.2	-10.0	-10.0
-7.8	-7.5	-5.5	-3.9	-4.0	-5.4	-5.9	-7.7	-9.4	-11.7	-12.0	-6.4	-7.1	-5.9	-3.5	-4.2	-6.9	-9.2	-10.9	-11.6	-9.3	-7.6	-6.6	-4.7	-5.3	-6.6	-7.9	-9.2	-11.4	-12.1	-8.8	-6.7	-7.4	-8.6	-8.9	-8.0
-5.3	-5.0	-4.4	-4.2	-3.9	-2.4	-2.9	-2.4	-3.4	-5.3	-6.9	-6.0	-6.2	-5.4	-4.0	-3.7	-3.5	-4.9	-5.9	-7.7	-7.1	-6.5	-6.2	-5.4	-4.8	-4.7	-4.8	-5.3	-5.7	-6.1	-5.3	-4.8	-5.4	-5.2	-4.8	-4.3
-1.4	-2.0	-2.3	-1.9	-1.8	-1.8	-1.8	-1.1	-1.3	-1.9	-1.9	-2.9	-3.2	-2.6	-2.0	-2.6	-2.1	-2.5	-1.5	-1.5	-1.7	-1.8	-1.9	-2.7	-2.8	-2.7	-2.5	-2.7	-1.9	-1.6	-2.0	-1.6	-1.5	-1.8	-2.1	-1.3
-1.3	-.5	-.6	-.5	.1	.5	1.1	1.1	1.3	1.3	1.2	.8	.4	-.3	.4	.2	.1	-.1	.2	.7	1.2	1.5	1.4	1.0	1.0	.8	.6	.3	.0	.4	.4	.0	.2	-.1	-.5	-.8
1.7	2.0	2.3	2.1	2.3	2.7	2.6	2.7	2.9	3.0	2.8	2.8	2.1	1.9	2.1	2.4	2.8	2.6	2.2	2.7	3.1	3.4	3.9	4.4	3.8	3.4	4.1	4.2	3.5	2.6	2.6	2.7	1.4	.8	1.1	1.8
1.7	2.0	2.5	3.5	5.0	5.4	4.9	4.4	5.5	5.3	4.5	4.8	3.6	3.3	3.5	4.3	5.8	8.7	11.1	12.6	13.2	14.3	14.9	13.1	9.1	10.0	13.5	15.7	14.7	14.1	13.8	12.0	10.2	8.4	3.6	1.6
4.0	3.6	3.7	4.5	5.5	6.5	7.8	9.4	9.2	7.1	5.5	4.9	5.3	5.6	6.6	7.6	8.8	10.1	11.2	12.0	12.7	14.1	15.7	16.5	16.7	16.9	16.5	15.8	14.8	13.7	12.4	10.9	9.8	8.1	5.2	4.3

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

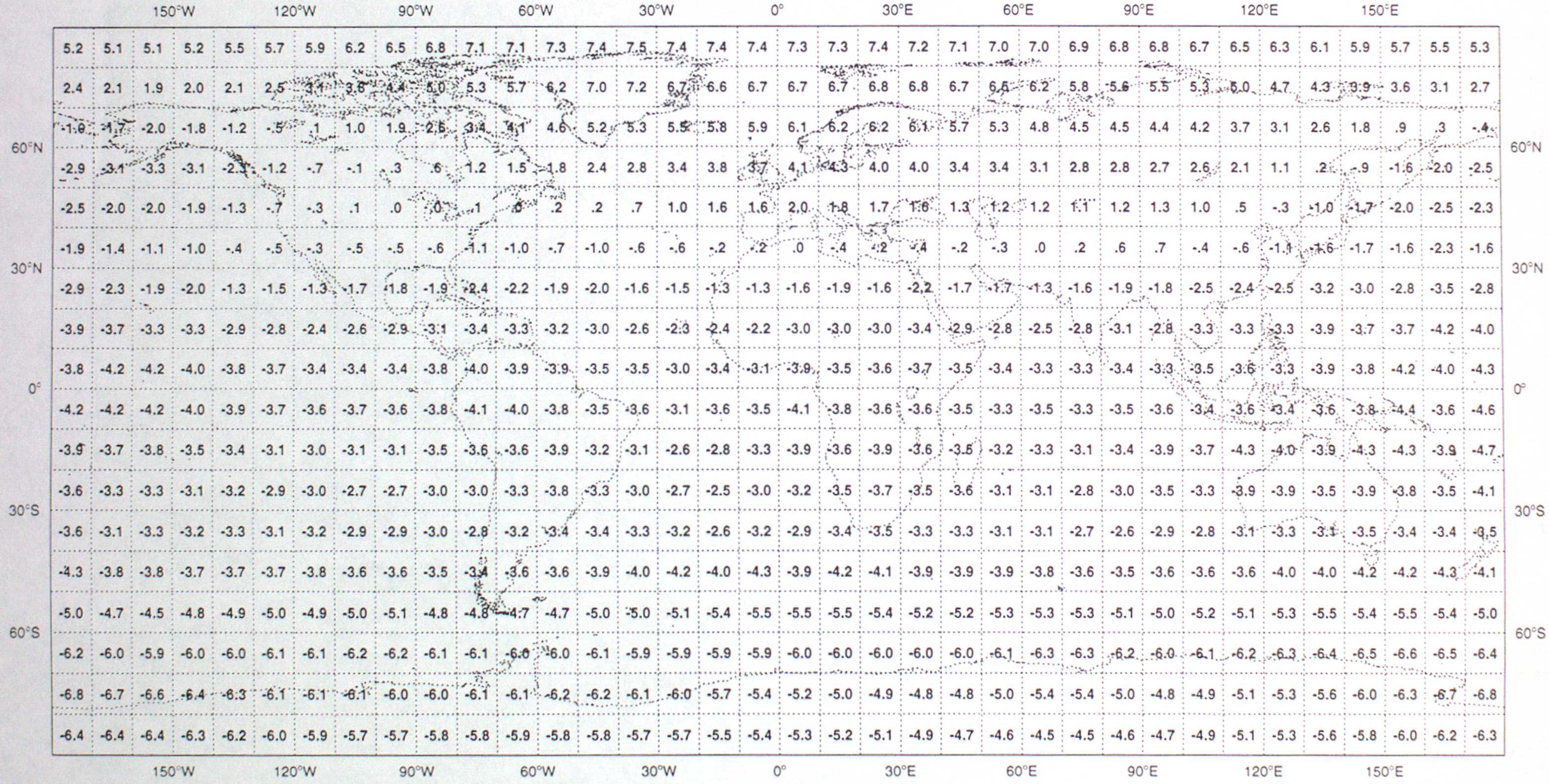


2.9	2.7	2.7	2.7	2.8	2.9	3.0	3.1	3.3	3.8	4.4	3.0	3.3	3.9	4.1	3.0	2.8	2.8	3.0	3.1	3.0	3.0	3.1	3.2	3.2	3.1	3.2	3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.1	3.1
3.1	2.8	2.8	3.0	3.5	3.8	3.9	3.6	3.5	3.6	3.8	3.9	6.1	6.7	6.9	4.9	3.0	2.9	2.8	3.3	3.2	3.0	2.9	3.4	3.1	2.9	2.7	2.8	3.1	3.1	3.2	2.9	2.8	2.8	3.0	3.2
4.0	3.1	3.8	4.7	5.3	5.8	4.9	4.2	3.7	3.5	3.3	3.5	3.2	6.0	5.8	4.3	3.9	3.8	3.8	4.1	3.9	3.2	2.8	2.7	2.6	2.3	2.3	3.3	3.5	3.3	2.9	3.0	3.5	3.5	4.6	4.5
2.8	2.9	3.0	3.1	3.8	4.0	3.6	3.2	2.9	2.7	2.7	3.0	2.9	4.1	3.9	4.0	4.1	3.9	4.0	3.7	3.5	2.7	2.5	2.5	2.5	3.1	4.0	3.8	3.7	3.6	3.3	3.2	2.7	2.7	3.0	2.8
3.3	3.2	3.3	3.5	3.5	3.4	3.0	2.7	3.8	3.7	3.7	3.8	3.7	3.7	4.4	4.0	4.3	4.2	3.6	3.7	3.5	3.9	3.1	3.6	3.6	4.1	4.5	4.3	3.5	3.0	3.0	4.1	3.2	2.7	2.9	3.4
4.8	4.3	4.4	5.1	4.9	4.5	4.5	4.6	4.8	4.8	4.7	4.6	3.8	3.6	3.7	3.6	4.1	4.4	4.0	3.7	3.8	3.8	4.3	4.2	3.9	6.1	4.5	3.8	3.6	3.4	3.4	3.6	4.0	3.9	3.5	4.3
4.4	5.0	4.8	4.2	4.7	4.1	4.4	4.5	4.2	4.9	5.4	5.0	4.6	4.3	4.2	4.6	5.1	4.7	4.7	4.2	4.3	4.1	4.6	4.7	4.4	4.2	6.3	5.1	4.1	3.9	3.6	3.4	3.5	3.6	3.2	4.0
4.2	5.1	5.2	5.0	6.1	6.2	5.7	4.2	4.3	4.1	4.6	3.8	4.6	4.7	4.6	4.9	4.3	4.7	4.0	3.3	3.0	2.9	3.7	4.1	3.9	4.7	6.1	5.2	3.7	4.0	3.8	3.6	3.6	4.2	4.6	4.2
4.2	4.8	3.9	3.4	3.4	3.6	3.4	3.3	2.7	2.9	3.1	3.4	3.4	3.5	3.3	3.8	3.2	3.0	2.5	3.4	3.1	2.8	3.6	3.8	3.5	4.2	3.2	3.1	3.4	3.4	3.1	3.3	3.5	3.9	4.7	5.1
2.0	3.3	3.7	3.6	3.7	3.0	2.6	2.4	2.2	2.9	3.2	1.8	2.5	2.8	2.9	3.8	2.7	1.9	2.9	2.9	2.7	2.9	3.6	3.0	3.3	3.6	3.1	3.5	4.4	3.1	3.1	2.8	2.5	2.7	3.2	3.1
3.7	3.7	3.9	3.4	5.0	5.4	3.6	3.1	2.8	3.8	5.9	2.9	2.9	3.9	3.6	3.2	3.4	2.8	4.5	4.4	4.6	3.2	3.4	4.3	3.8	4.1	5.1	5.0	4.1	4.3	4.3	3.8	4.5	4.4	3.8	3.8
4.5	4.7	4.8	4.4	4.2	5.2	4.6	4.2	4.0	3.6	4.5	4.2	5.0	5.4	4.5	4.1	4.2	3.7	4.1	4.1	5.1	5.2	4.9	4.6	4.1	4.2	4.2	4.5	4.7	4.2	4.2	4.3	4.7	5.4	5.1	4.5
5.0	5.0	4.4	4.2	4.2	4.0	4.5	4.2	4.4	4.5	4.7	4.0	4.8	4.7	4.3	4.4	4.2	4.0	4.6	4.8	4.4	4.9	4.5	4.5	4.8	4.5	4.2	4.1	4.4	4.4	4.1	4.4	4.4	4.5	4.4	4.8
3.4	4.1	4.4	3.7	3.9	4.0	3.8	3.7	3.7	4.0	3.9	3.8	4.5	4.0	3.7	3.6	4.0	3.7	3.4	3.4	3.5	3.7	3.8	4.0	4.2	4.0	3.7	3.9	3.7	3.4	3.6	3.6	3.6	3.5	3.5	3.5
3.7	3.6	3.4	3.5	3.2	3.4	3.2	2.9	3.0	3.1	3.0	3.2	3.6	3.8	3.4	3.6	3.2	3.1	3.2	3.0	3.1	3.0	3.1	3.2	3.1	3.0	3.1	3.4	3.4	3.3	3.3	3.2	3.3	3.4	3.2	3.5
3.4	3.3	3.1	3.0	2.9	2.9	2.5	2.6	2.6	2.5	2.5	2.8	2.8	2.9	3.0	3.0	2.9	3.0	3.2	2.9	2.9	2.8	3.1	3.6	3.0	2.8	3.3	3.9	4.2	3.9	4.5	4.8	4.0	4.0	3.5	3.3
3.3	3.3	3.1	2.8	3.2	3.4	2.9	3.0	2.5	2.2	2.1	2.4	2.4	2.5	2.6	2.7	3.2	4.2	4.8	5.0	5.7	5.3	4.4	3.9	4.0	3.9	4.0	4.1	3.8	3.8	3.6	3.5	3.7	3.6	4.0	3.4
4.6	4.3	4.1	3.6	3.2	2.9	2.5	1.9	1.9	2.4	3.1	3.5	3.5	3.5	3.3	2.8	2.6	2.3	2.2	2.1	2.3	2.6	2.9	3.2	3.3	3.3	3.1	2.9	2.6	2.5	2.4	2.5	2.9	3.5	4.7	4.7

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001

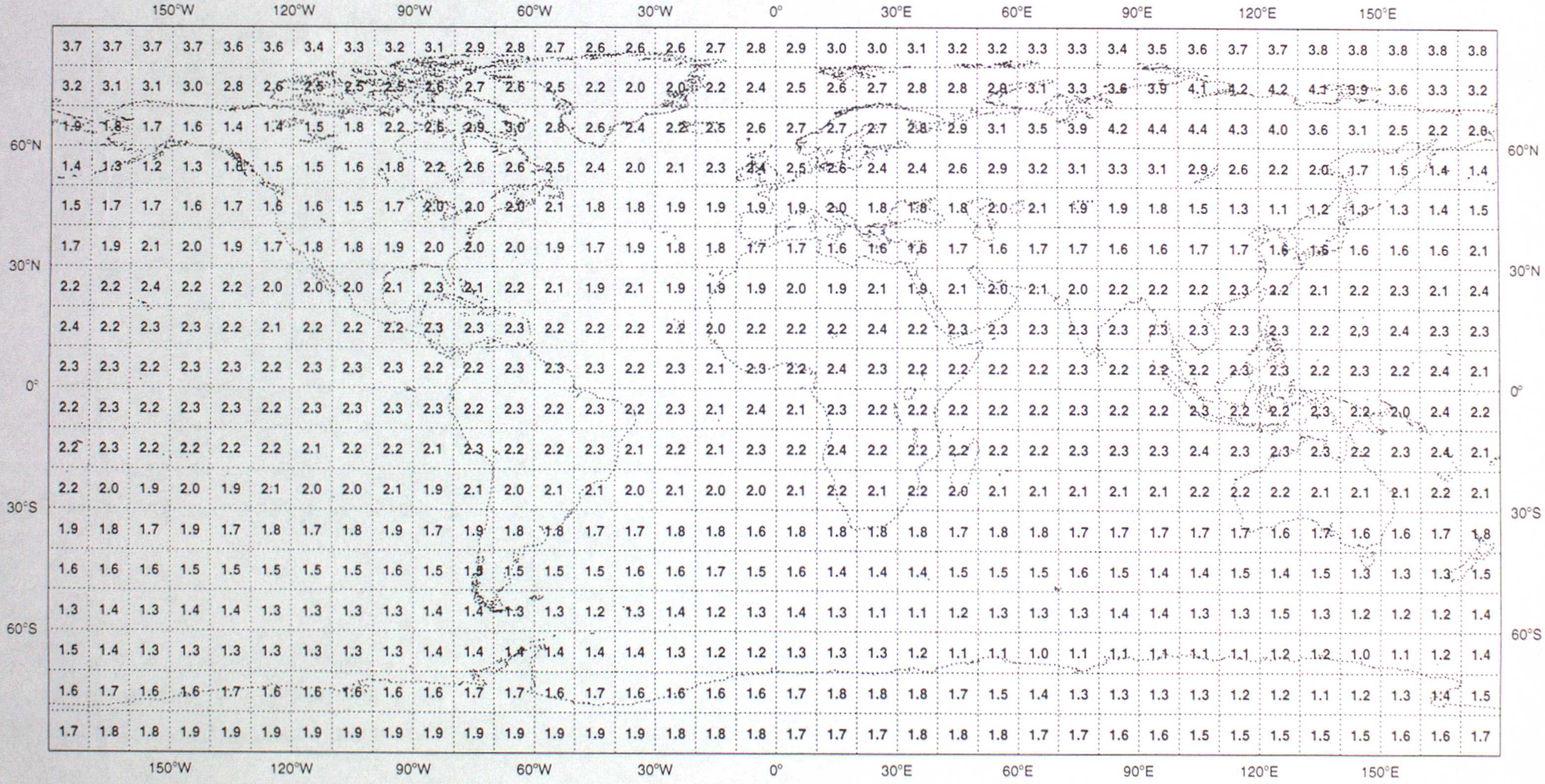
Channel: HIRS4 (400 hPa)

NOAA15, using all observations



5.2	5.1	5.1	5.2	5.5	5.7	5.9	6.2	6.5	6.8	7.1	7.1	7.3	7.4	7.5	7.4	7.4	7.4	7.3	7.3	7.4	7.2	7.1	7.0	7.0	6.9	6.8	6.8	6.7	6.5	6.3	6.1	5.9	5.7	5.5	5.3
2.4	2.1	1.9	2.0	2.1	2.5	3.1	3.6	4.4	5.0	5.3	5.7	6.2	7.0	7.2	6.7	6.6	6.7	6.7	6.7	6.8	6.8	6.7	6.6	6.2	5.8	5.6	5.5	5.3	5.0	4.7	4.3	3.9	3.6	3.1	2.7
-1.9	-1.7	-2.0	-1.8	-1.2	-.5	.1	1.0	1.9	2.5	3.4	4.1	4.6	5.2	5.3	5.5	5.8	5.9	6.1	6.2	6.2	6.1	5.7	5.3	4.8	4.5	4.5	4.4	4.2	3.7	3.1	2.6	1.8	.9	.3	-.4
-2.9	-3.1	-3.3	-3.1	-2.3	-1.2	-.7	-.1	.3	.6	1.2	1.5	1.8	2.4	2.8	3.4	3.8	3.7	4.1	4.3	4.0	4.0	3.4	3.4	3.1	2.8	2.8	2.7	2.6	2.1	1.1	.2	-.9	-1.6	-2.0	-2.5
-2.5	-2.0	-2.0	-1.9	-1.3	-.7	-.3	.1	.0	.0	.1	.0	.2	.2	.7	1.0	1.6	1.6	2.0	1.8	1.7	1.6	1.3	1.2	1.2	1.1	1.2	1.3	1.0	.5	-.3	-1.0	-1.7	-2.0	-2.5	-2.3
-1.9	-1.4	-1.1	-1.0	-.4	-.5	-.3	-.5	-.5	-.6	-1.1	-1.0	-.7	-1.0	-.6	-.6	-.2	-.2	.0	-.4	-.2	-.4	-.2	-.3	.0	.2	.6	.7	-.4	-.6	-1.1	-1.6	-1.7	-1.6	-2.3	-1.6
-2.9	-2.3	-1.9	-2.0	-1.3	-1.5	-1.3	-1.7	-1.8	-1.9	-2.4	-2.2	-1.9	-2.0	-1.6	-1.5	-1.3	-1.3	-1.6	-1.9	-1.6	-2.2	-1.7	-1.7	-1.3	-1.6	-1.9	-1.8	-2.5	-2.4	-2.5	-3.2	-3.0	-2.8	-3.5	-2.8
-3.9	-3.7	-3.3	-3.3	-2.9	-2.8	-2.4	-2.6	-2.9	-3.1	-3.4	-3.3	-3.2	-3.0	-2.6	-2.3	-2.4	-2.2	-3.0	-3.0	-3.0	-3.4	-2.9	-2.8	-2.5	-2.8	-3.1	-2.8	-3.3	-3.3	-3.3	-3.9	-3.7	-3.7	-4.2	-4.0
-3.8	-4.2	-4.2	-4.0	-3.8	-3.7	-3.4	-3.4	-3.4	-3.8	-4.0	-3.9	-3.9	-3.5	-3.5	-3.0	-3.4	-3.1	-3.9	-3.5	-3.6	-3.7	-3.5	-3.4	-3.3	-3.3	-3.4	-3.3	-3.5	-3.6	-3.3	-3.9	-3.8	-4.2	-4.0	-4.3
-4.2	-4.2	-4.2	-4.0	-3.9	-3.7	-3.6	-3.7	-3.6	-3.8	-4.1	-4.0	-3.8	-3.5	-3.6	-3.1	-3.6	-3.5	-4.1	-3.8	-3.6	-3.6	-3.5	-3.3	-3.5	-3.3	-3.5	-3.6	-3.4	-3.6	-3.4	-3.6	-3.8	-4.4	-3.6	-4.6
-3.9	-3.7	-3.8	-3.5	-3.4	-3.1	-3.0	-3.1	-3.1	-3.5	-3.6	-3.6	-3.9	-3.2	-3.1	-2.6	-2.8	-3.3	-3.9	-3.6	-3.9	-3.6	-3.5	-3.2	-3.3	-3.1	-3.4	-3.9	-3.7	-4.3	-4.0	-3.9	-4.3	-4.3	-3.9	-4.7
-3.6	-3.3	-3.3	-3.1	-3.2	-2.9	-3.0	-2.7	-2.7	-3.0	-3.0	-3.3	-3.8	-3.3	-3.0	-2.7	-2.5	-3.0	-3.2	-3.5	-3.7	-3.5	-3.6	-3.1	-3.1	-2.8	-3.0	-3.5	-3.3	-3.9	-3.9	-3.5	-3.9	-3.8	-3.5	-4.1
-3.6	-3.1	-3.3	-3.2	-3.3	-3.1	-3.2	-2.9	-2.9	-3.0	-2.8	-3.2	-3.4	-3.4	-3.3	-3.2	-2.6	-3.2	-2.9	-3.4	-3.5	-3.3	-3.3	-3.1	-3.1	-2.7	-2.6	-2.9	-2.8	-3.1	-3.3	-3.1	-3.5	-3.4	-3.4	-3.5
-4.3	-3.8	-3.8	-3.7	-3.7	-3.7	-3.8	-3.6	-3.6	-3.5	-3.4	-3.6	-3.6	-3.9	-4.0	-4.2	-4.0	-4.3	-3.9	-4.2	-4.1	-3.9	-3.9	-3.9	-3.8	-3.6	-3.5	-3.6	-3.6	-3.6	-4.0	-4.0	-4.2	-4.2	-4.3	-4.1
-5.0	-4.7	-4.5	-4.8	-4.9	-5.0	-4.9	-5.0	-5.1	-4.8	-4.8	-4.7	-4.7	-5.0	-5.0	-5.1	-5.4	-5.5	-5.5	-5.5	-5.4	-5.2	-5.2	-5.3	-5.3	-5.3	-5.1	-5.0	-5.2	-5.1	-5.3	-5.5	-5.4	-5.5	-5.4	-5.0
-6.2	-6.0	-5.9	-6.0	-6.0	-6.1	-6.1	-6.2	-6.2	-6.1	-6.1	-6.0	-6.0	-6.1	-5.9	-5.9	-5.9	-5.9	-6.0	-6.0	-6.0	-6.0	-6.0	-6.1	-6.3	-6.3	-6.2	-6.0	-6.1	-6.2	-6.3	-6.4	-6.5	-6.6	-6.5	-6.4
-6.8	-6.7	-6.6	-6.4	-6.3	-6.1	-6.1	-6.1	-6.0	-6.0	-6.1	-6.1	-6.2	-6.2	-6.1	-6.0	-5.7	-5.4	-5.2	-5.0	-4.9	-4.8	-4.8	-5.0	-5.4	-5.4	-5.0	-4.8	-4.9	-5.1	-5.3	-5.6	-6.0	-6.3	-6.7	-6.8
-6.4	-6.4	-6.4	-6.3	-6.2	-6.0	-5.9	-5.7	-5.7	-5.8	-5.8	-5.9	-5.8	-5.8	-5.7	-5.7	-5.5	-5.4	-5.3	-5.2	-5.1	-4.9	-4.7	-4.6	-4.5	-4.5	-4.6	-4.7	-4.9	-5.1	-5.3	-5.6	-5.8	-6.0	-6.2	-6.3

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



3.7	3.7	3.7	3.7	3.6	3.6	3.4	3.3	3.2	3.1	2.9	2.8	2.7	2.6	2.6	2.6	2.7	2.8	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.3	3.4	3.5	3.6	3.7	3.7	3.8	3.8	3.8	3.8	3.8
3.2	3.1	3.1	3.0	2.8	2.6	2.5	2.5	2.5	2.6	2.7	2.6	2.5	2.2	2.0	2.0	2.2	2.4	2.5	2.6	2.7	2.8	2.8	2.8	3.1	3.3	3.6	3.9	4.1	4.2	4.2	4.1	3.9	3.6	3.3	3.2
1.9	1.8	1.7	1.6	1.4	1.4	1.5	1.8	2.2	2.5	2.9	3.0	2.8	2.6	2.4	2.2	2.5	2.6	2.7	2.7	2.7	2.8	2.9	3.1	3.5	3.9	4.2	4.4	4.4	4.3	4.0	3.6	3.1	2.5	2.2	2.8
1.4	1.3	1.2	1.3	1.8	1.5	1.5	1.6	1.8	2.2	2.6	2.6	2.5	2.4	2.0	2.1	2.3	2.4	2.5	2.6	2.4	2.4	2.6	2.9	3.2	3.1	3.3	3.1	2.9	2.6	2.2	2.0	1.7	1.5	1.4	1.4
1.5	1.7	1.7	1.6	1.7	1.6	1.6	1.5	1.7	2.0	2.0	2.0	2.1	1.8	1.8	1.9	1.9	1.9	1.9	2.0	1.8	1.8	1.8	2.0	2.1	1.9	1.9	1.8	1.5	1.3	1.1	1.2	1.3	1.3	1.4	1.5
1.7	1.9	2.1	2.0	1.9	1.7	1.8	1.8	1.9	2.0	2.0	2.0	1.9	1.7	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.6	1.7	1.7	1.6	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.6	2.1
2.2	2.2	2.4	2.2	2.2	2.0	2.0	2.0	2.1	2.3	2.1	2.2	2.1	1.9	2.1	1.9	1.9	1.9	2.0	1.9	2.1	1.9	2.1	2.0	2.1	2.0	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.3	2.1	2.4
2.4	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.0	2.2	2.2	2.2	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.3
2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.1	2.3	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.4	2.1
2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.2	2.3	2.1	2.4	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.0	2.4	2.2
2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.3	2.2	2.2	2.3	2.1	2.2	2.1	2.3	2.2	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.4	2.1
2.2	2.0	1.9	2.0	1.9	2.1	2.0	2.0	2.1	1.9	2.1	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1
1.9	1.8	1.7	1.9	1.7	1.8	1.7	1.8	1.9	1.7	1.9	1.8	1.8	1.7	1.7	1.8	1.8	1.6	1.8	1.8	1.8	1.8	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.7	1.6	1.6	1.7	1.8
1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.5	1.6	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.5	1.4	1.4	1.5	1.4	1.5	1.3	1.3	1.3	1.5
1.3	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.2	1.3	1.4	1.2	1.3	1.4	1.3	1.1	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.5	1.3	1.2	1.2	1.2	1.4
1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.2	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.0	1.1	1.2	1.4
1.6	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.7	1.5	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.2	1.3	1.4	1.5
1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

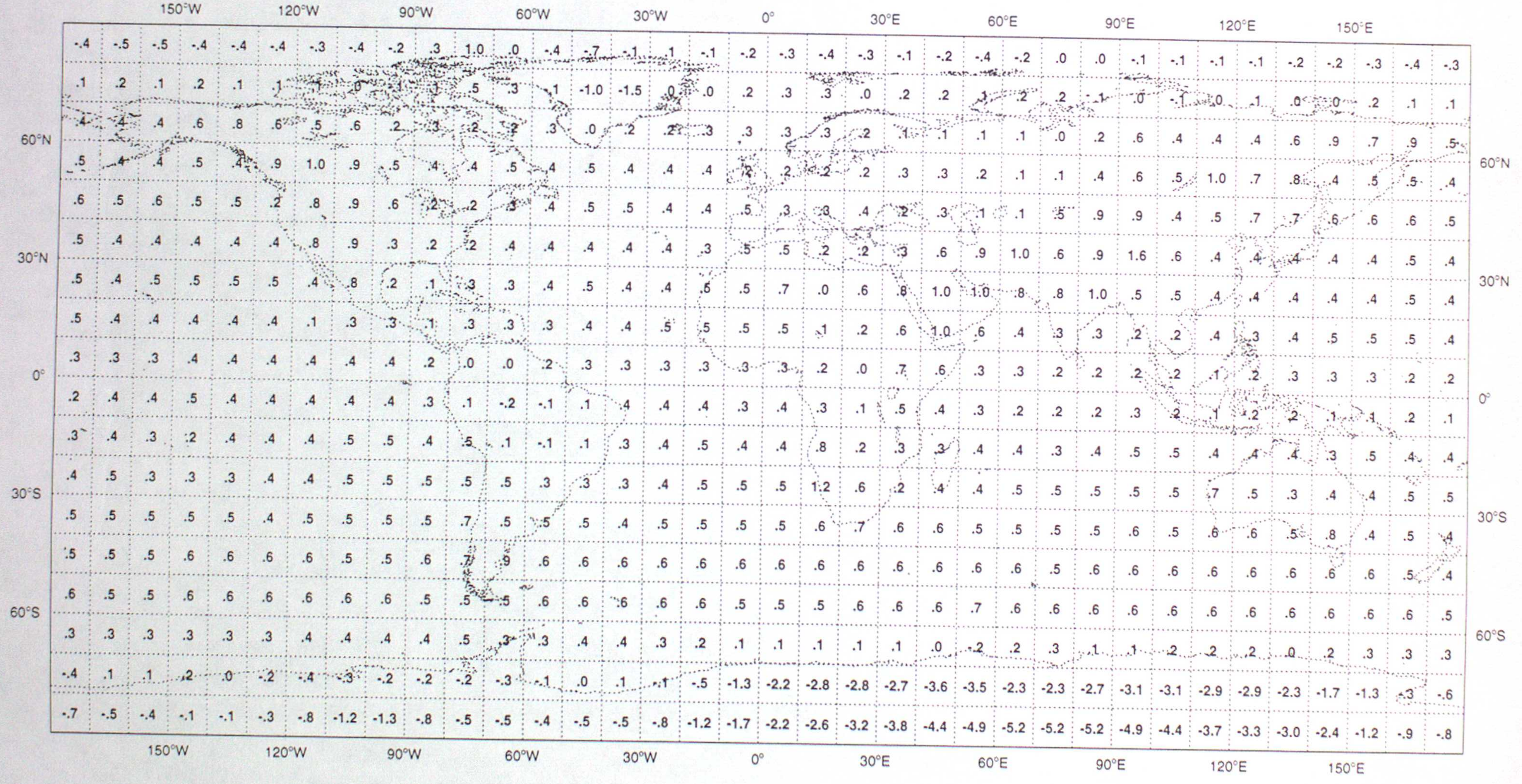


Figure 35. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

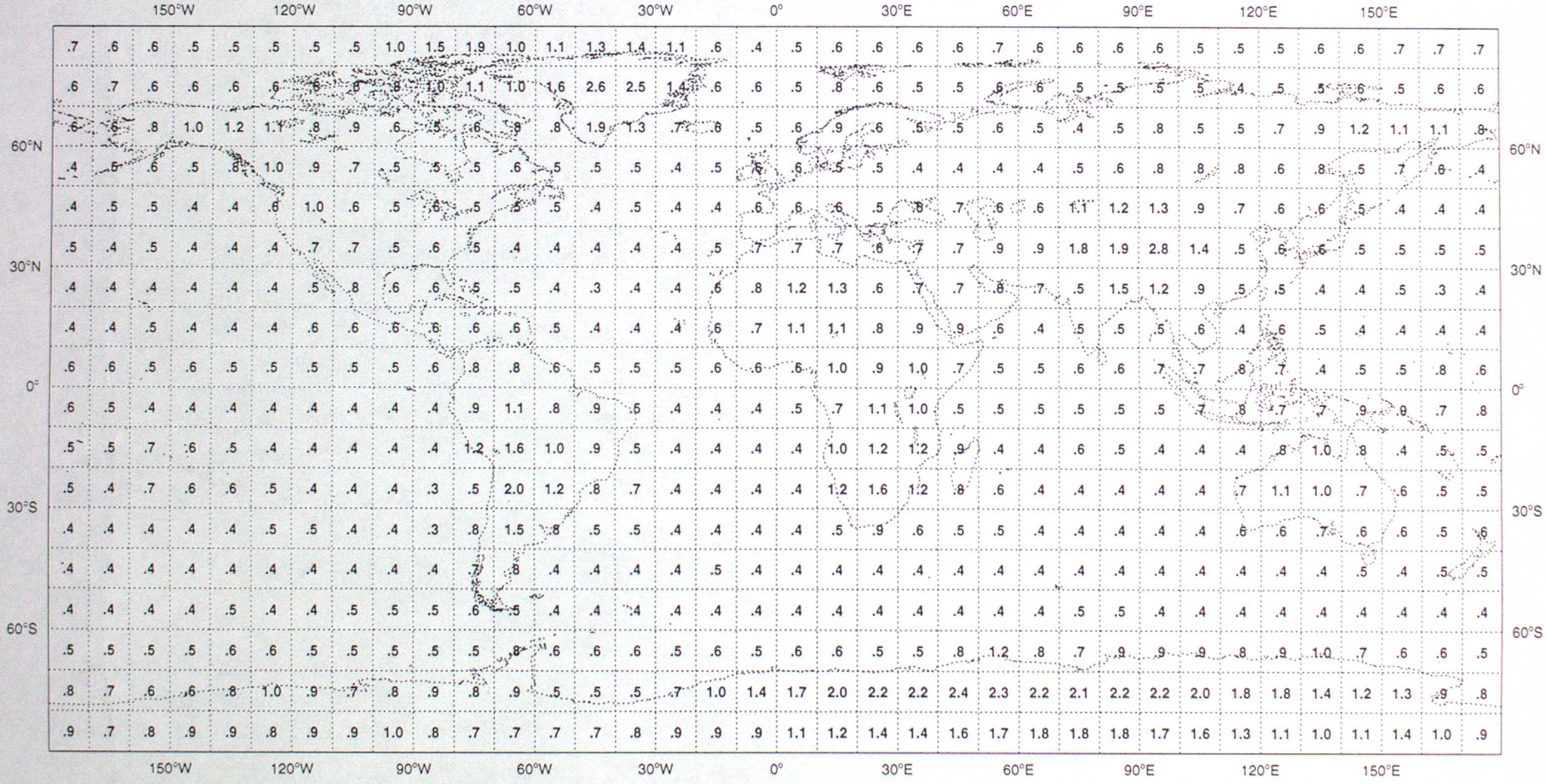


Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

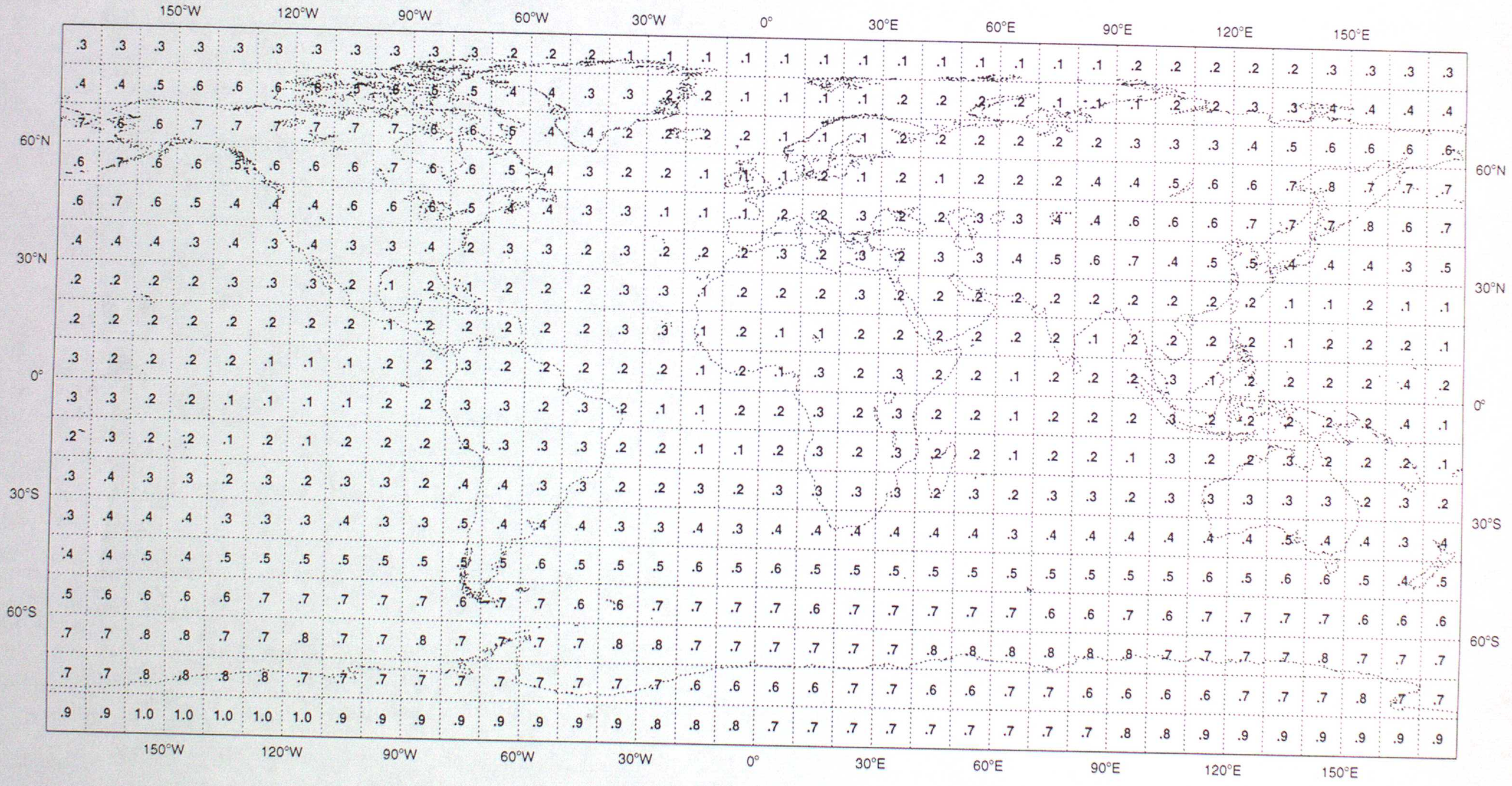


Figure 37. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

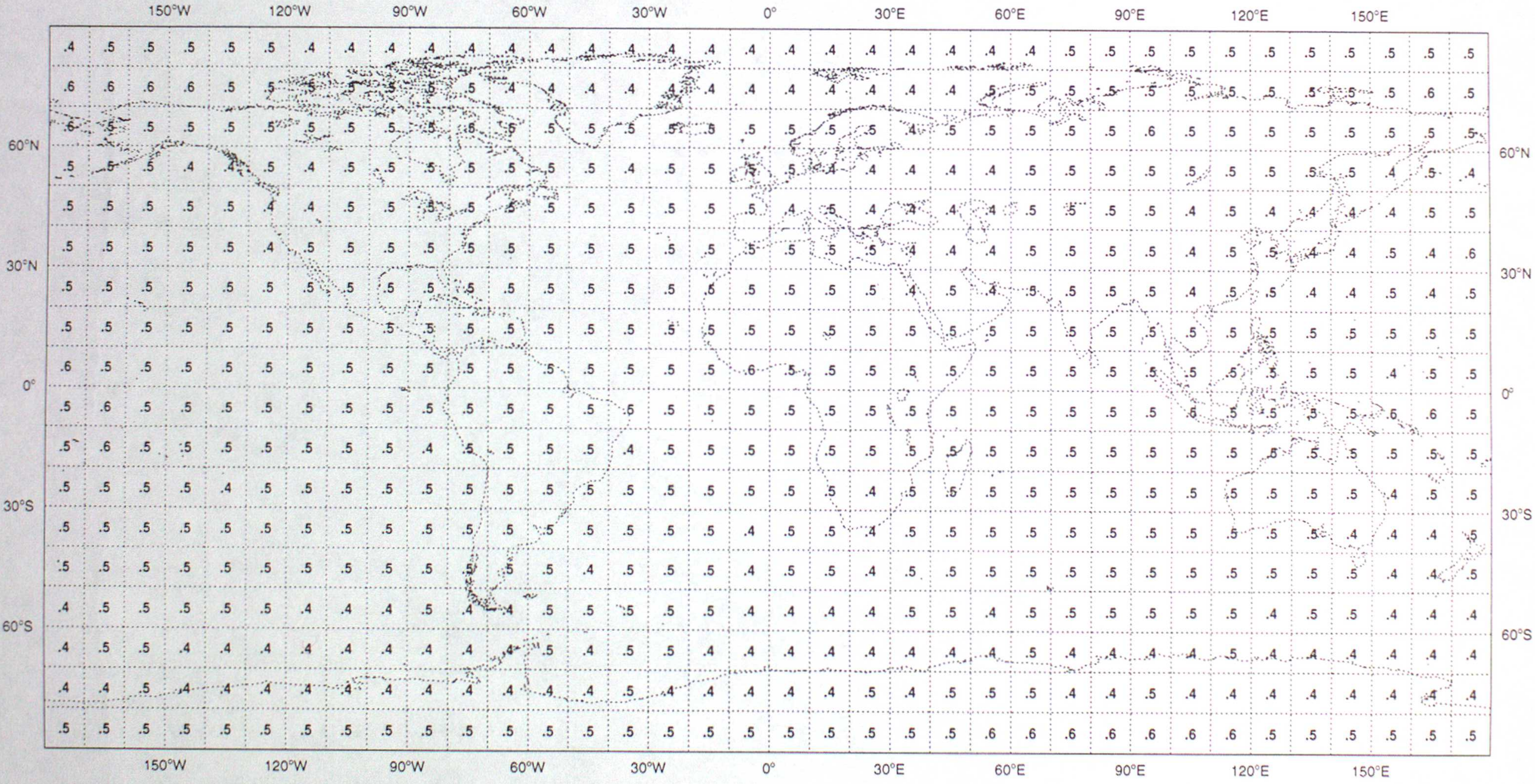


Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

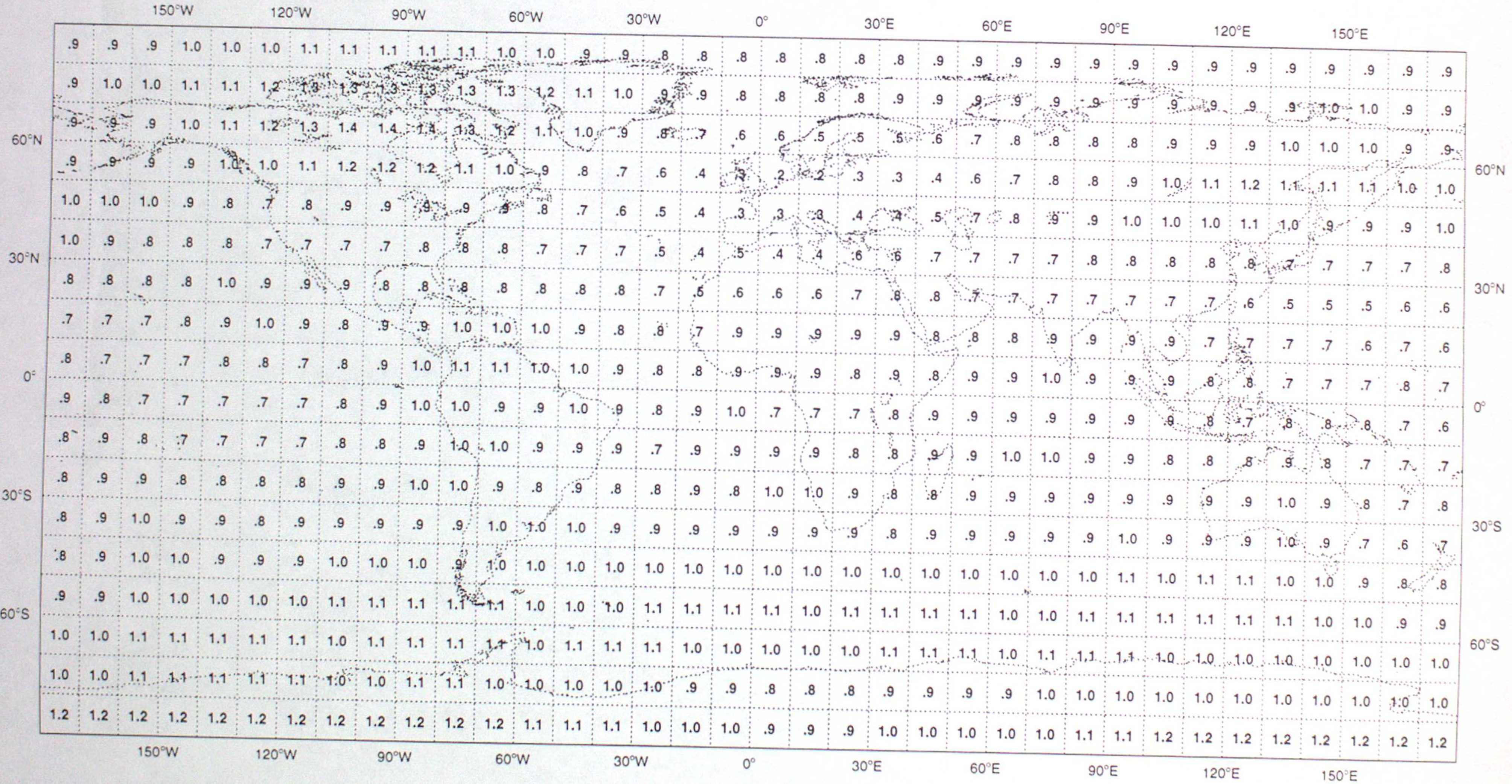


Figure 39. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

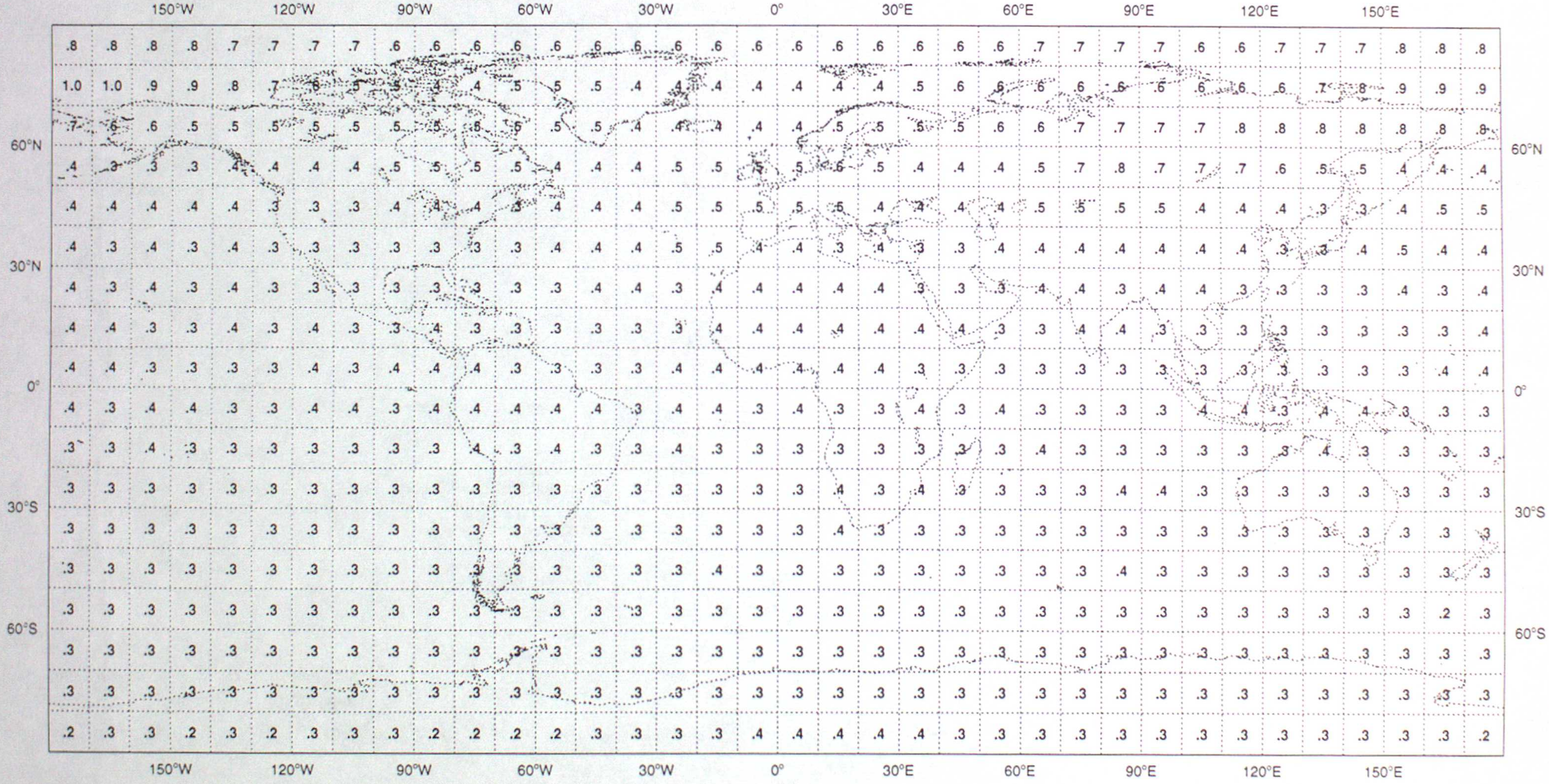
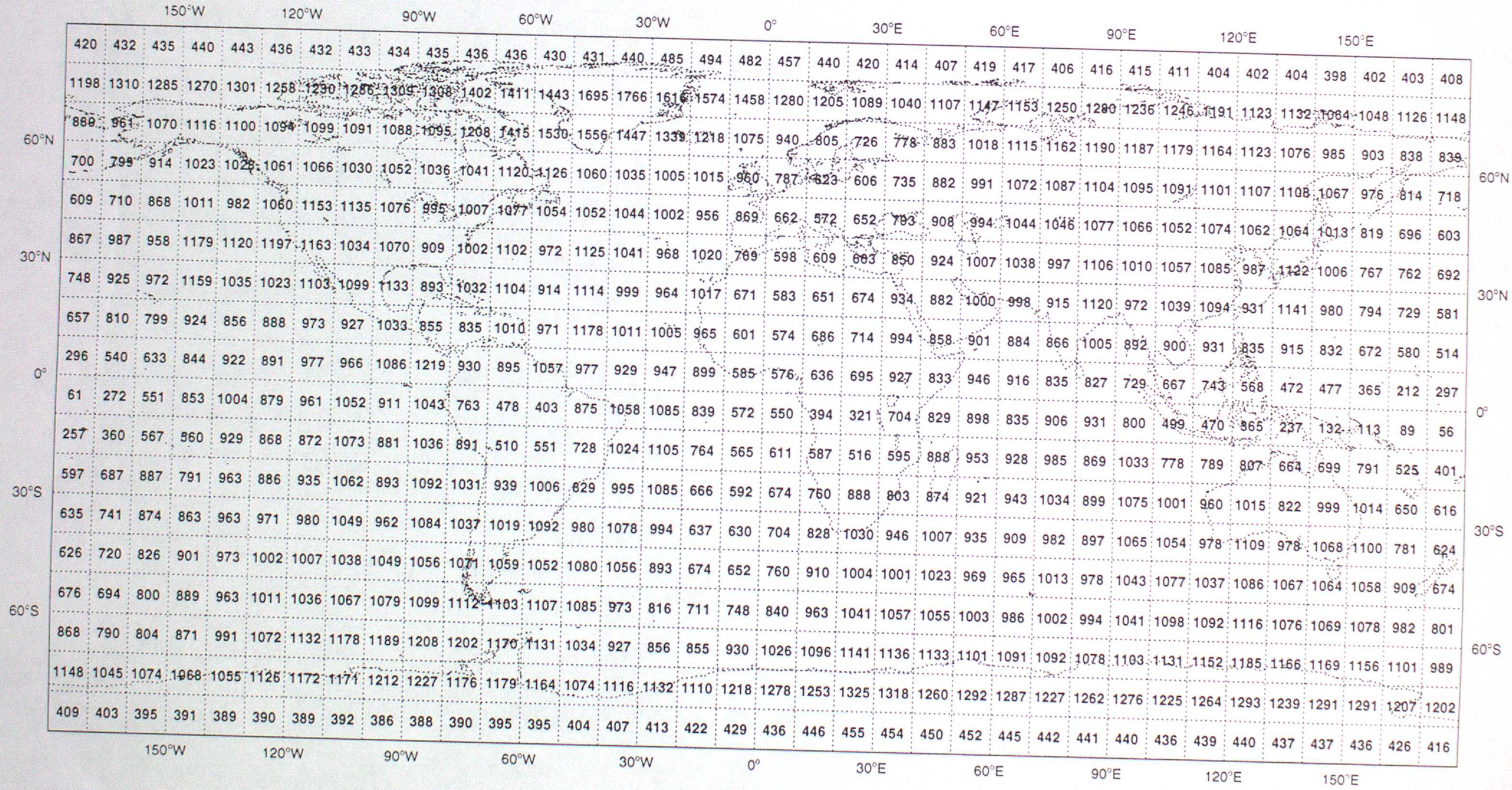
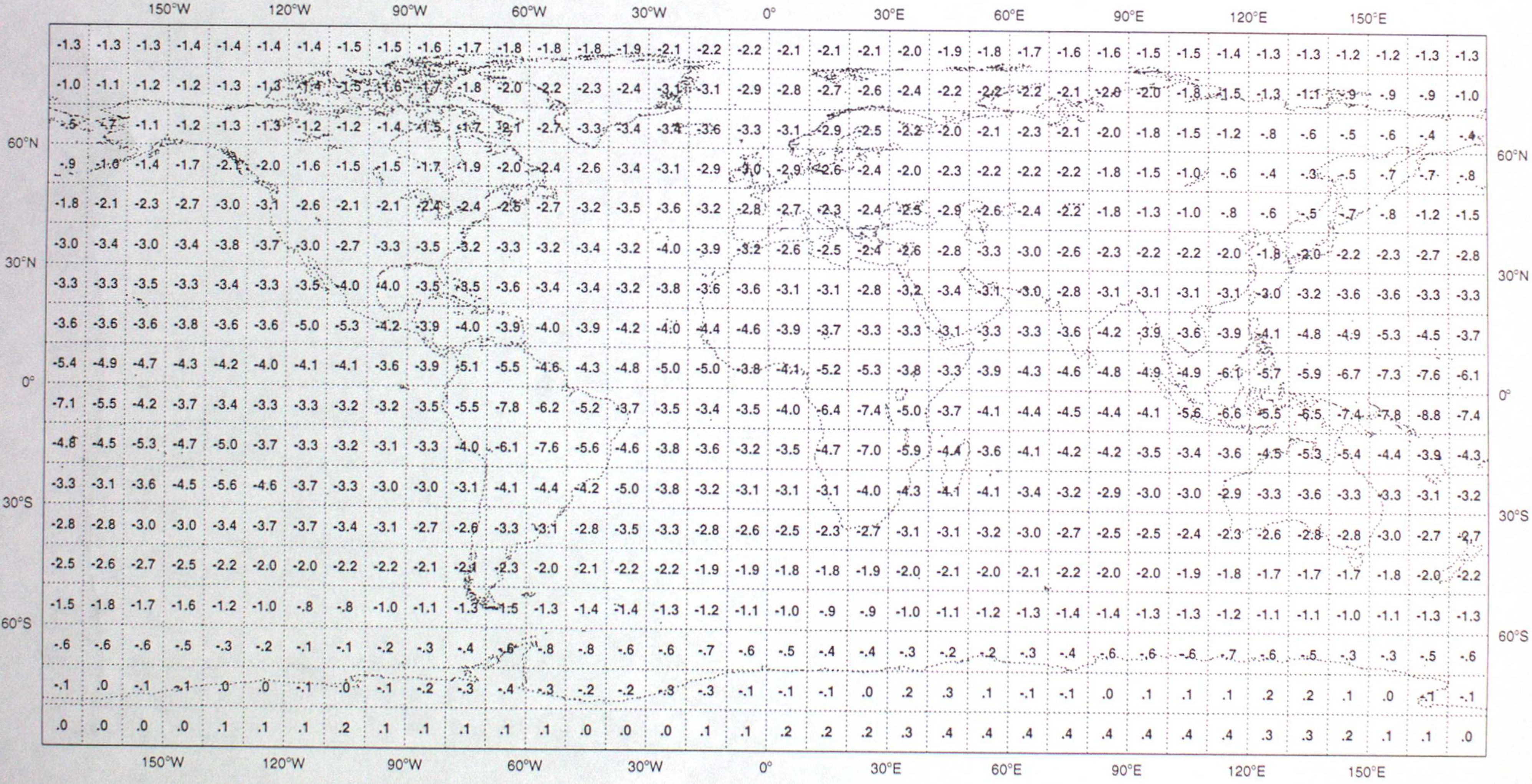


Figure 40. ATOVS mean daily count. DECEMBER 2001
NOAA16, using all observations
Global average number of observations in 24 hours = 577917



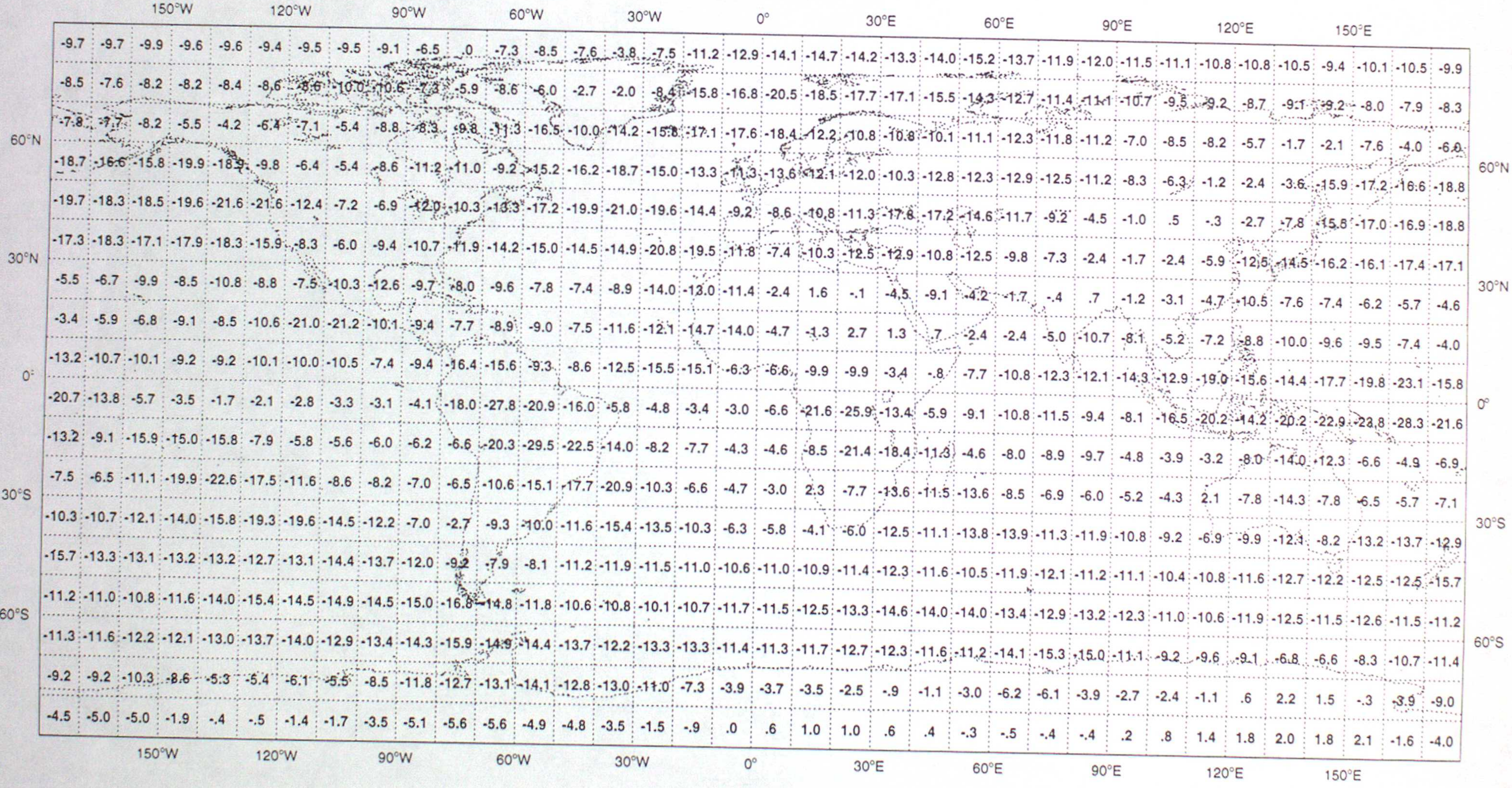
420	432	435	440	443	436	432	433	434	435	436	436	430	431	440	485	494	482	457	440	420	414	407	419	417	406	416	415	411	404	402	404	398	402	403	408
1198	1310	1285	1270	1301	1258	1230	1286	1309	1308	1402	1411	1443	1695	1766	1616	1574	1458	1280	1205	1089	1040	1107	1147	1153	1250	1280	1236	1246	1191	1123	1132	1064	1048	1126	1148
889	961	1070	1116	1100	1094	1099	1091	1088	1095	1208	1415	1530	1556	1447	1339	1218	1075	940	805	726	778	883	1018	1115	1162	1190	1187	1179	1164	1123	1076	985	903	838	839
700	799	914	1023	1028	1061	1066	1030	1052	1036	1041	1120	1126	1060	1035	1005	1015	960	787	623	606	735	882	991	1072	1087	1104	1095	1091	1101	1107	1108	1067	976	814	718
609	710	868	1011	982	1060	1153	1135	1076	995	1007	1077	1054	1052	1044	1002	956	869	662	572	652	793	908	994	1044	1046	1077	1066	1052	1074	1062	1064	1013	819	696	603
867	987	958	1179	1120	1197	1163	1034	1070	909	1002	1102	972	1125	1041	968	1020	769	598	609	663	850	924	1007	1038	997	1106	1010	1057	1085	987	1122	1006	767	762	692
748	925	972	1159	1035	1023	1103	1099	1133	893	1032	1104	914	1114	999	964	1017	671	583	651	674	934	882	1000	998	915	1120	972	1039	1094	931	1141	980	794	729	581
657	810	799	924	856	888	973	927	1033	855	835	1010	971	1178	1011	1005	965	601	574	686	714	994	858	901	884	866	1005	892	900	931	835	915	832	672	580	514
296	540	633	844	922	891	977	966	1086	1219	930	895	1057	977	929	947	899	585	576	636	695	927	833	946	916	835	827	729	667	743	568	472	477	365	212	297
61	272	551	853	1004	879	961	1052	911	1043	763	478	403	875	1058	1085	839	572	550	394	321	704	829	898	835	906	931	800	499	470	365	237	132	113	89	56
257	360	567	560	929	868	872	1073	881	1036	891	510	551	728	1024	1105	764	565	611	587	516	595	888	953	928	985	869	1033	778	789	807	664	699	791	525	401
597	687	887	791	963	886	935	1062	893	1092	1031	939	1006	629	995	1085	666	592	674	760	888	803	874	921	943	1034	899	1075	1001	960	1015	822	999	1014	650	616
635	741	874	863	963	971	980	1049	962	1084	1037	1019	1092	980	1078	994	637	630	704	828	1030	946	1007	935	909	982	897	1065	1054	978	1109	978	1068	1100	781	624
626	720	826	901	973	1002	1007	1038	1049	1056	1071	1059	1052	1080	1056	893	674	652	760	910	1004	1001	1023	969	965	1013	978	1043	1077	1037	1086	1067	1064	1058	909	674
676	694	800	889	963	1011	1036	1067	1079	1099	1112	1103	1107	1085	973	816	711	748	840	963	1041	1057	1055	1003	986	1002	994	1041	1098	1092	1116	1076	1069	1078	982	801
868	790	804	871	991	1072	1132	1178	1189	1208	1202	1170	1131	1034	927	856	855	930	1026	1096	1141	1136	1133	1101	1091	1092	1078	1103	1131	1152	1185	1166	1169	1156	1101	989
1148	1045	1074	1068	1055	1126	1172	1171	1212	1227	1176	1179	1164	1074	1116	1132	1110	1218	1278	1253	1325	1318	1260	1292	1287	1227	1262	1276	1225	1264	1293	1239	1291	1291	1207	1202
409	403	395	391	389	390	389	392	386	388	390	395	395	404	407	413	422	429	436	446	455	454	450	452	445	442	441	440	436	439	440	437	437	436	426	416

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS8 (Surface)
NOAA16, using all observations



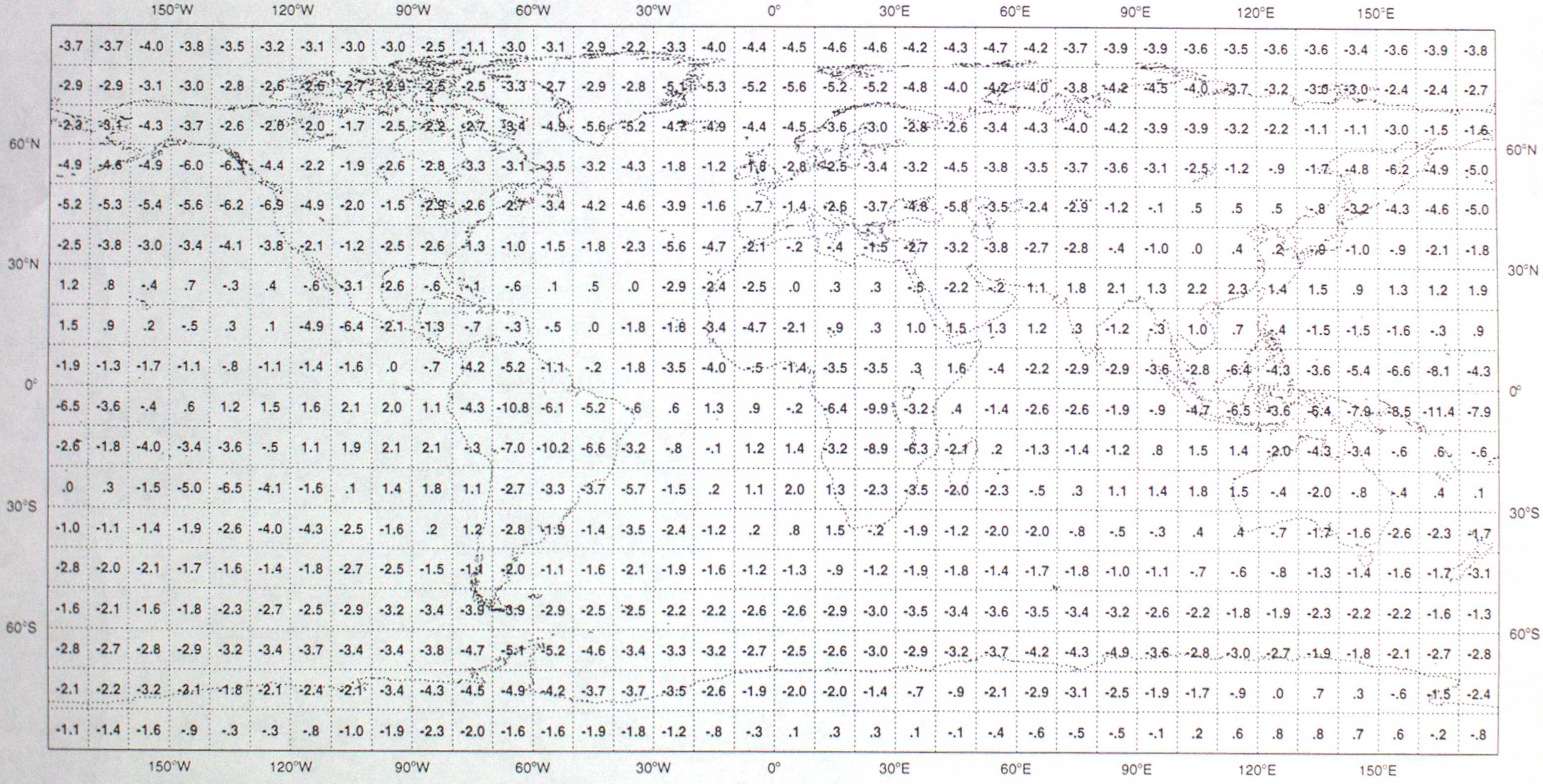
-1.3	-1.3	-1.3	-1.4	-1.4	-1.4	-1.4	-1.5	-1.5	-1.6	-1.7	-1.8	-1.8	-1.8	-1.9	-2.1	-2.2	-2.2	-2.1	-2.1	-2.1	-2.0	-1.9	-1.8	-1.7	-1.6	-1.6	-1.5	-1.5	-1.4	-1.3	-1.3	-1.2	-1.2	-1.3	-1.3
-1.0	-1.1	-1.2	-1.2	-1.3	-1.3	-1.4	-1.5	-1.6	-1.7	-1.8	-2.0	-2.2	-2.3	-2.4	-3.1	-3.1	-2.9	-2.8	-2.7	-2.6	-2.4	-2.2	-2.2	-2.2	-2.1	-2.0	-2.0	-1.8	-1.5	-1.3	-1.1	-.9	-.9	-.9	-1.0
-.5	-.7	-1.1	-1.2	-1.3	-1.3	-1.2	-1.2	-1.4	-1.5	-1.7	-2.1	-2.7	-3.3	-3.4	-3.4	-3.6	-3.3	-3.1	-2.9	-2.5	-2.2	-2.0	-2.1	-2.3	-2.1	-2.0	-1.8	-1.5	-1.2	-.8	-.6	-.5	-.6	-.4	-.4
-.9	-1.6	-1.4	-1.7	-2.1	-2.0	-1.6	-1.5	-1.5	-1.7	-1.9	-2.0	-2.4	-2.6	-3.4	-3.1	-2.9	-3.0	-2.9	-2.6	-2.4	-2.0	-2.3	-2.2	-2.2	-2.2	-1.8	-1.5	-1.0	-.6	-.4	-.3	-.5	-.7	-.7	-.8
-1.8	-2.1	-2.3	-2.7	-3.0	-3.1	-2.6	-2.1	-2.1	-2.4	-2.4	-2.5	-2.7	-3.2	-3.5	-3.6	-3.2	-2.8	-2.7	-2.3	-2.4	-2.5	-2.9	-2.6	-2.4	-2.2	-1.8	-1.3	-1.0	-.8	-.6	-.5	-.7	-.8	-1.2	-1.5
-3.0	-3.4	-3.0	-3.4	-3.8	-3.7	-3.0	-2.7	-3.3	-3.5	-3.2	-3.3	-3.2	-3.4	-3.2	-4.0	-3.9	-3.2	-2.6	-2.5	-2.4	-2.6	-2.8	-3.3	-3.0	-2.6	-2.3	-2.2	-2.2	-2.0	-1.8	-2.0	-2.2	-2.3	-2.7	-2.8
-3.3	-3.3	-3.5	-3.3	-3.4	-3.3	-3.5	-4.0	-4.0	-3.5	-3.5	-3.6	-3.4	-3.4	-3.2	-3.8	-3.6	-3.6	-3.1	-3.1	-2.8	-3.2	-3.4	-3.1	-3.0	-2.8	-3.1	-3.1	-3.1	-3.1	-3.0	-3.2	-3.6	-3.6	-3.3	-3.3
-3.6	-3.6	-3.6	-3.8	-3.6	-3.6	-5.0	-5.3	-4.2	-3.9	-4.0	-3.9	-4.0	-3.9	-4.2	-4.0	-4.4	-4.6	-3.9	-3.7	-3.3	-3.3	-3.1	-3.3	-3.3	-3.6	-4.2	-3.9	-3.6	-3.9	-4.1	-4.8	-4.9	-5.3	-4.5	-3.7
-5.4	-4.9	-4.7	-4.3	-4.2	-4.0	-4.1	-4.1	-3.6	-3.9	-5.1	-5.5	-4.6	-4.3	-4.8	-5.0	-5.0	-3.8	-4.1	-5.2	-5.3	-3.8	-3.3	-3.9	-4.3	-4.6	-4.8	-4.9	-4.9	-6.1	-5.7	-5.9	-6.7	-7.3	-7.6	-6.1
-7.1	-5.5	-4.2	-3.7	-3.4	-3.3	-3.3	-3.2	-3.2	-3.5	-5.5	-7.8	-6.2	-5.2	-3.7	-3.5	-3.4	-3.5	-4.0	-6.4	-7.4	-5.0	-3.7	-4.1	-4.4	-4.5	-4.4	-4.1	-5.6	-6.6	-5.5	-6.5	-7.4	-7.8	-8.8	-7.4
-4.8	-4.5	-5.3	-4.7	-5.0	-3.7	-3.3	-3.2	-3.1	-3.3	-4.0	-6.1	-7.6	-5.6	-4.6	-3.8	-3.6	-3.2	-3.5	-4.7	-7.0	-5.9	-4.4	-3.6	-4.1	-4.2	-4.2	-3.5	-3.4	-3.6	-4.5	-5.3	-5.4	-4.4	-3.9	-4.3
-3.3	-3.1	-3.6	-4.5	-5.6	-4.6	-3.7	-3.3	-3.0	-3.0	-3.1	-4.1	-4.4	-4.2	-5.0	-3.8	-3.2	-3.1	-3.1	-3.1	-4.0	-4.3	-4.1	-4.1	-3.4	-3.2	-2.9	-3.0	-3.0	-2.9	-3.3	-3.6	-3.3	-3.3	-3.1	-3.2
-2.8	-2.8	-3.0	-3.0	-3.4	-3.7	-3.7	-3.4	-3.1	-2.7	-2.6	-3.3	-3.1	-2.8	-3.5	-3.3	-2.8	-2.6	-2.5	-2.3	-2.7	-3.1	-3.1	-3.2	-3.0	-2.7	-2.5	-2.5	-2.4	-2.3	-2.6	-2.8	-2.8	-3.0	-2.7	-2.7
-2.5	-2.6	-2.7	-2.5	-2.2	-2.0	-2.0	-2.2	-2.2	-2.1	-2.1	-2.3	-2.0	-2.1	-2.2	-2.2	-1.9	-1.9	-1.8	-1.8	-1.9	-2.0	-2.1	-2.0	-2.1	-2.2	-2.0	-2.0	-1.9	-1.8	-1.7	-1.7	-1.7	-1.8	-2.0	-2.2
-1.5	-1.8	-1.7	-1.6	-1.2	-1.0	-.8	-.8	-1.0	-1.1	-1.3	-1.5	-1.3	-1.4	-1.4	-1.3	-1.2	-1.1	-1.0	-.9	-.9	-1.0	-1.1	-1.2	-1.3	-1.4	-1.4	-1.3	-1.3	-1.2	-1.1	-1.1	-1.0	-1.1	-1.3	-1.3
-.6	-.6	-.6	-.5	-.3	-.2	-.1	-.1	-.2	-.3	-.4	-.6	-.8	-.8	-.6	-.6	-.7	-.6	-.5	-.4	-.4	-.3	-.2	-.2	-.3	-.4	-.6	-.6	-.6	-.7	-.6	-.5	-.3	-.3	-.5	-.6
-.1	.0	-.1	-.1	.0	.0	-.1	.0	-.1	-.2	-.3	-.4	-.3	-.2	-.2	-.3	-.3	-.1	-.1	-.1	.0	.2	.3	.1	-.1	-.1	.0	.1	.1	.1	.2	.2	.1	.0	-.1	-.1
.0	.0	.0	.0	.1	.1	.1	.2	.1	.1	.1	.1	.1	.0	.0	.0	.1	.1	.2	.2	.2	.3	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.2	.1	.1	.0

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS8 (Surface)
NOAA16, using all observations



-9.7	-9.7	-9.9	-9.6	-9.6	-9.4	-9.5	-9.5	-9.1	-6.5	.0	-7.3	-8.5	-7.6	-3.8	-7.5	-11.2	-12.9	-14.1	-14.7	-14.2	-13.3	-14.0	-15.2	-13.7	-11.9	-12.0	-11.5	-11.1	-10.8	-10.8	-10.5	-9.4	-10.1	-10.5	-9.9
-8.5	-7.6	-8.2	-8.2	-8.4	-8.6	-8.6	-10.0	-10.6	-7.3	-5.9	-8.6	-6.0	-2.7	-2.0	-8.4	-15.8	-16.8	-20.5	-18.5	-17.7	-17.1	-15.5	-14.3	-12.7	-11.4	-11.1	-10.7	-9.5	-9.2	-8.7	-9.1	-9.2	-8.0	-7.9	-8.3
-7.8	-7.7	-8.2	-5.5	-4.2	-6.4	-7.1	-5.4	-8.8	-8.3	-9.8	-11.3	-16.5	-10.0	-14.2	-15.8	-17.1	-17.6	-18.4	-12.2	-10.8	-10.8	-10.1	-11.1	-12.3	-11.8	-11.2	-7.0	-8.5	-8.2	-5.7	-1.7	-2.1	-7.6	-4.0	-6.0
-18.7	-16.6	-15.8	-19.9	-18.9	-9.8	-6.4	-5.4	-8.6	-11.2	-11.0	-9.2	-15.2	-16.2	-18.7	-15.0	-13.3	-11.3	-13.6	-12.1	-12.0	-10.3	-12.8	-12.3	-12.9	-12.5	-11.2	-8.3	-6.3	-1.2	-2.4	-3.6	-15.9	-17.2	-16.6	-18.8
-19.7	-18.3	-18.5	-19.6	-21.6	-21.6	-12.4	-7.2	-6.9	-12.0	-10.3	-13.3	-17.2	-19.9	-21.0	-19.6	-14.4	-9.2	-8.6	-10.8	-11.3	-17.8	-17.2	-14.6	-11.7	-9.2	-4.5	-1.0	.5	-.3	-2.7	-7.8	-15.8	-17.0	-16.9	-18.8
-17.3	-18.3	-17.1	-17.9	-18.3	-15.9	-8.3	-6.0	-9.4	-10.7	-11.9	-14.2	-15.0	-14.5	-14.9	-20.8	-19.5	-11.8	-7.4	-10.3	-12.5	-12.9	-10.8	-12.5	-9.8	-7.3	-2.4	-1.7	-2.4	-5.9	-12.5	-14.5	-16.2	-16.1	-17.4	-17.1
-5.5	-6.7	-9.9	-8.5	-10.8	-8.8	-7.5	-10.3	-12.6	-9.7	-8.0	-9.6	-7.8	-7.4	-8.9	-14.0	-13.0	-11.4	-2.4	1.6	-.1	-4.5	-9.1	-4.2	-1.7	-.4	.7	-1.2	-3.1	-4.7	-10.5	-7.6	-7.4	-6.2	-5.7	-4.6
-3.4	-5.9	-6.8	-9.1	-8.5	-10.6	-21.0	-21.2	-10.1	-9.4	-7.7	-8.9	-9.0	-7.5	-11.6	-12.1	-14.7	-14.0	-4.7	-1.3	2.7	1.3	.7	-2.4	-2.4	-5.0	-10.7	-8.1	-5.2	-7.2	-8.8	-10.0	-9.6	-9.5	-7.4	-4.0
-13.2	-10.7	-10.1	-9.2	-9.2	-10.1	-10.0	-10.5	-7.4	-9.4	-16.4	-15.6	-9.3	-8.6	-12.5	-15.5	-15.1	-6.3	-6.6	-9.9	-9.9	-3.4	-.8	-7.7	-10.8	-12.3	-12.1	-14.3	-12.9	-19.0	-15.6	-14.4	-17.7	-19.8	-23.1	-15.8
-20.7	-13.8	-5.7	-3.5	-1.7	-2.1	-2.8	-3.3	-3.1	-4.1	-18.0	-27.8	-20.9	-16.0	-5.8	-4.8	-3.4	-3.0	-6.6	-21.6	-25.9	-13.4	-5.9	-9.1	-10.8	-11.5	-9.4	-8.1	-16.5	-20.2	-14.2	-20.2	-22.9	-23.8	-28.3	-21.6
-13.2	-9.1	-15.9	-15.0	-15.8	-7.9	-5.8	-5.6	-6.0	-6.2	-6.6	-20.3	-29.5	-22.5	-14.0	-8.2	-7.7	-4.3	-4.6	-8.5	-21.4	-18.4	-11.3	-4.6	-8.0	-8.9	-9.7	-4.8	-3.9	-3.2	-8.0	-14.0	-12.3	-6.6	-4.9	-6.9
-7.5	-6.5	-11.1	-19.9	-22.6	-17.5	-11.6	-8.6	-8.2	-7.0	-6.5	-10.6	-15.1	-17.7	-20.9	-10.3	-6.6	-4.7	-3.0	2.3	-7.7	-13.6	-11.5	-13.6	-8.5	-6.9	-6.0	-5.2	-4.3	2.1	-7.8	-14.3	-7.8	-6.5	-5.7	-7.1
-10.3	-10.7	-12.1	-14.0	-15.8	-19.3	-19.6	-14.5	-12.2	-7.0	-2.7	-9.3	-10.0	-11.6	-15.4	-13.5	-10.3	-6.3	-5.8	-4.1	-6.0	-12.5	-11.1	-13.8	-13.9	-11.3	-11.9	-10.8	-9.2	-6.9	-9.9	-12.1	-8.2	-13.2	-13.7	-12.9
-15.7	-13.3	-13.1	-13.2	-13.2	-12.7	-13.1	-14.4	-13.7	-12.0	-9.2	-7.9	-8.1	-11.2	-11.9	-11.5	-11.0	-10.6	-11.0	-10.9	-11.4	-12.3	-11.6	-10.5	-11.9	-12.1	-11.2	-11.1	-10.4	-10.8	-11.6	-12.7	-12.2	-12.5	-12.5	-15.7
-11.2	-11.0	-10.8	-11.6	-14.0	-15.4	-14.5	-14.9	-14.5	-15.0	-16.8	-14.8	-11.8	-10.6	-10.8	-10.1	-10.7	-11.7	-11.5	-12.5	-13.3	-14.6	-14.0	-14.0	-13.4	-12.9	-13.2	-12.3	-11.0	-10.6	-11.9	-12.5	-11.5	-12.6	-11.5	-11.2
-11.3	-11.6	-12.2	-12.1	-13.0	-13.7	-14.0	-12.9	-13.4	-14.3	-15.9	-14.9	-14.4	-13.7	-12.2	-13.3	-13.3	-11.4	-11.3	-11.7	-12.7	-12.3	-11.6	-11.2	-14.1	-15.3	-15.0	-11.1	-9.2	-9.6	-9.1	-6.8	-6.6	-8.3	-10.7	-11.4
-9.2	-9.2	-10.3	-8.6	-5.3	-5.4	-6.1	-5.5	-8.5	-11.8	-12.7	-13.1	-14.1	-12.8	-13.0	-11.0	-7.3	-3.9	-3.7	-3.5	-2.5	-.9	-1.1	-3.0	-6.2	-6.1	-3.9	-2.7	-2.4	-1.1	.6	2.2	1.5	-.3	-3.9	-9.0
-4.5	-5.0	-5.0	-1.9	-.4	-.5	-1.4	-1.7	-3.5	-5.1	-5.6	-5.6	-4.9	-4.8	-3.5	-1.5	-.9	.0	.6	1.0	1.0	.6	.4	-.3	-.5	-.4	-.4	.2	.8	1.4	1.8	2.0	1.8	2.1	-1.6	-4.0

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-3.7	-3.7	-4.0	-3.8	-3.5	-3.2	-3.1	-3.0	-3.0	-2.5	-1.1	-3.0	-3.1	-2.9	-2.2	-3.3	-4.0	-4.4	-4.5	-4.6	-4.6	-4.2	-4.3	-4.7	-4.2	-3.7	-3.9	-3.9	-3.6	-3.5	-3.6	-3.6	-3.4	-3.6	-3.9	-3.8
-2.9	-2.9	-3.1	-3.0	-2.8	-2.6	-2.6	-2.7	-2.9	-2.5	-2.5	-3.3	-2.7	-2.9	-2.8	-5.1	-5.3	-5.2	-5.6	-5.2	-5.2	-4.8	-4.0	-4.2	-4.0	-3.8	-4.2	-4.5	-4.0	-3.7	-3.2	-3.0	-3.0	-2.4	-2.4	-2.7
-2.3	-3.1	-4.3	-3.7	-2.6	-2.8	-2.0	-1.7	-2.5	-2.2	-2.7	-3.4	-4.9	-5.6	-5.2	-4.7	-4.9	-4.4	-4.5	-3.6	-3.0	-2.8	-2.6	-3.4	-4.3	-4.0	-4.2	-3.9	-3.9	-3.2	-2.2	-1.1	-1.1	-3.0	-1.5	-1.6
-4.9	-4.6	-4.9	-6.0	-6.3	-4.4	-2.2	-1.9	-2.6	-2.8	-3.3	-3.1	-3.5	-3.2	-4.3	-1.8	-1.2	-1.8	-2.8	-2.5	-3.4	-3.2	-4.5	-3.8	-3.5	-3.7	-3.6	-3.1	-2.5	-1.2	-.9	-1.7	-4.8	-6.2	-4.9	-5.0
-5.2	-5.3	-5.4	-5.6	-6.2	-6.9	-4.9	-2.0	-1.5	-2.9	-2.6	-2.7	-3.4	-4.2	-4.6	-3.9	-1.6	-.7	-1.4	-2.6	-3.7	-4.8	-5.8	-3.5	-2.4	-2.9	-1.2	-.1	.5	.5	.5	-.8	-3.2	-4.3	-4.6	-5.0
-2.5	-3.8	-3.0	-3.4	-4.1	-3.8	-2.1	-1.2	-2.5	-2.6	-1.3	-1.0	-1.5	-1.8	-2.3	-5.6	-4.7	-2.1	-.2	-.4	-1.5	-2.7	-3.2	-3.8	-2.7	-2.8	-.4	-1.0	.0	.4	.2	-.9	-1.0	-.9	-2.1	-1.8
1.2	.8	-.4	.7	-.3	.4	-.6	-3.1	2.6	-.6	-.1	-.6	.1	.5	.0	-2.9	-2.4	-2.5	.0	.3	.3	-.5	-2.2	-.2	1.1	1.8	2.1	1.3	2.2	2.3	1.4	1.5	.9	1.3	1.2	1.9
1.5	.9	.2	-.5	.3	.1	-4.9	-6.4	-2.1	-1.3	-.7	-.3	-.5	.0	-1.8	-1.8	-3.4	-4.7	-2.1	-.9	.3	1.0	1.5	1.3	1.2	.3	-1.2	-.3	1.0	.7	-.4	-1.5	-1.5	-1.6	-.3	.9
-1.9	-1.3	-1.7	-1.1	-.8	-1.1	-1.4	-1.6	.0	-.7	-4.2	-5.2	-1.1	-.2	-1.8	-3.5	-4.0	-.5	-1.4	-3.5	-3.5	.3	1.6	-.4	-2.2	-2.9	-2.9	-3.6	-2.8	-6.4	-4.3	-3.6	-5.4	-6.6	-8.1	-4.3
-6.5	-3.6	-.4	.6	1.2	1.5	1.6	2.1	2.0	1.1	-4.3	-10.8	-6.1	-5.2	-.6	.6	1.3	.9	-.2	-6.4	-9.9	-3.2	.4	-1.4	-2.6	-2.6	-1.9	-.9	-4.7	-6.5	-3.6	-6.4	-7.9	-8.5	-11.4	-7.9
-2.6	-1.8	-4.0	-3.4	-3.6	-.5	1.1	1.9	2.1	2.1	-.3	-7.0	-10.2	-6.6	-3.2	-.8	-.1	1.2	1.4	-3.2	-8.9	-6.3	-2.1	.2	-1.3	-1.4	-1.2	.8	1.5	1.4	-2.0	-4.3	-3.4	-.6	.6	-.6
.0	.3	-1.5	-5.0	-6.5	-4.1	-1.6	.1	1.4	1.8	1.1	-2.7	-3.3	-3.7	-5.7	-1.5	.2	1.1	2.0	1.3	-2.3	-3.5	-2.0	-2.3	-.5	.3	1.1	1.4	1.8	1.5	-.4	-2.0	-.8	-.4	.4	.1
-1.0	-1.1	-1.4	-1.9	-2.6	-4.0	-4.3	-2.5	-1.6	.2	1.2	-2.8	-1.9	-1.4	-3.5	-2.4	-1.2	.2	.8	1.5	-.2	-1.9	-1.2	-2.0	-2.0	-.8	-.5	-.3	.4	.4	-.7	-1.7	-1.6	-2.6	-2.3	-1.7
-2.8	-2.0	-2.1	-1.7	-1.6	-1.4	-1.8	-2.7	-2.5	-1.5	-1.1	-2.0	-1.1	-1.6	-2.1	-1.9	-1.6	-1.2	-1.3	-.9	-1.2	-1.9	-1.8	-1.4	-1.7	-1.8	-1.0	-1.1	-.7	-.6	-.8	-1.3	-1.4	-1.6	-1.7	-3.1
-1.6	-2.1	-1.6	-1.8	-2.3	-2.7	-2.5	-2.9	-3.2	-3.4	-3.9	-3.9	-2.9	-2.5	-2.5	-2.2	-2.2	-2.6	-2.6	-2.9	-3.0	-3.5	-3.4	-3.6	-3.5	-3.4	-3.2	-2.6	-2.2	-1.8	-1.9	-2.3	-2.2	-2.2	-1.6	-1.3
-2.8	-2.7	-2.8	-2.9	-3.2	-3.4	-3.7	-3.4	-3.4	-3.8	-4.7	-5.1	-5.2	-4.6	-3.4	-3.3	-3.2	-2.7	-2.5	-2.6	-3.0	-2.9	-3.2	-3.7	-4.2	-4.3	-4.9	-3.6	-2.8	-3.0	-2.7	-1.9	-1.8	-2.1	-2.7	-2.8
-2.1	-2.2	-3.2	-3.1	-1.8	-2.1	-2.4	-2.1	-3.4	-4.3	-4.5	-4.9	-4.2	-3.7	-3.7	-3.5	-2.6	-1.9	-2.0	-2.0	-1.4	-.7	-.9	-2.1	-2.9	-3.1	-2.5	-1.9	-1.7	-.9	.0	.7	.3	-.6	-1.5	-2.4
-1.1	-1.4	-1.6	-.9	-.3	-.3	-.8	-1.0	-1.9	-2.3	-2.0	-1.6	-1.6	-1.9	-1.8	-1.2	-.8	-.3	.1	.3	.3	.1	-.1	-.4	-.6	-.5	-.5	-.1	.2	.6	.8	.8	.7	.6	-.2	-.8

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

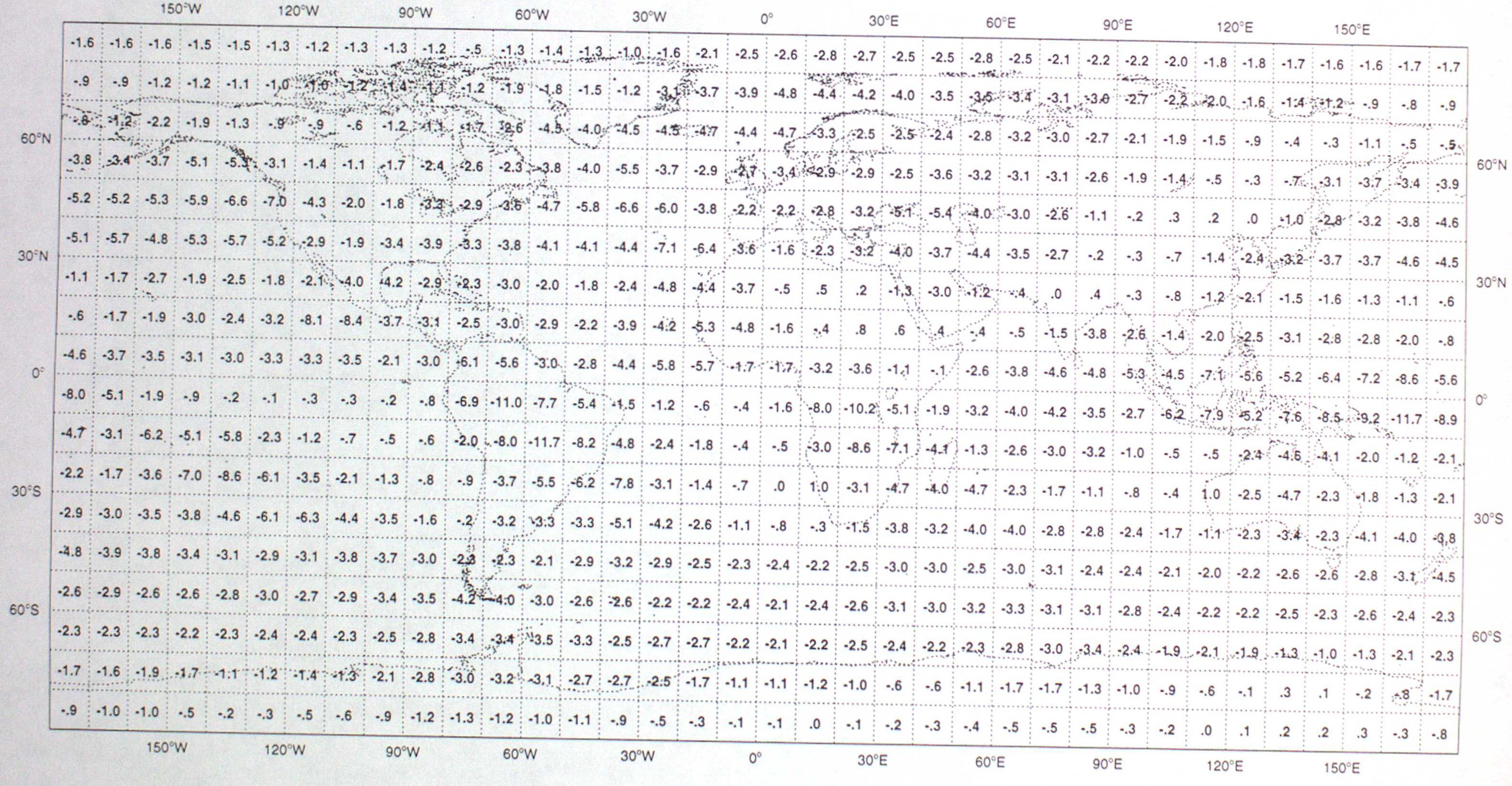


Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

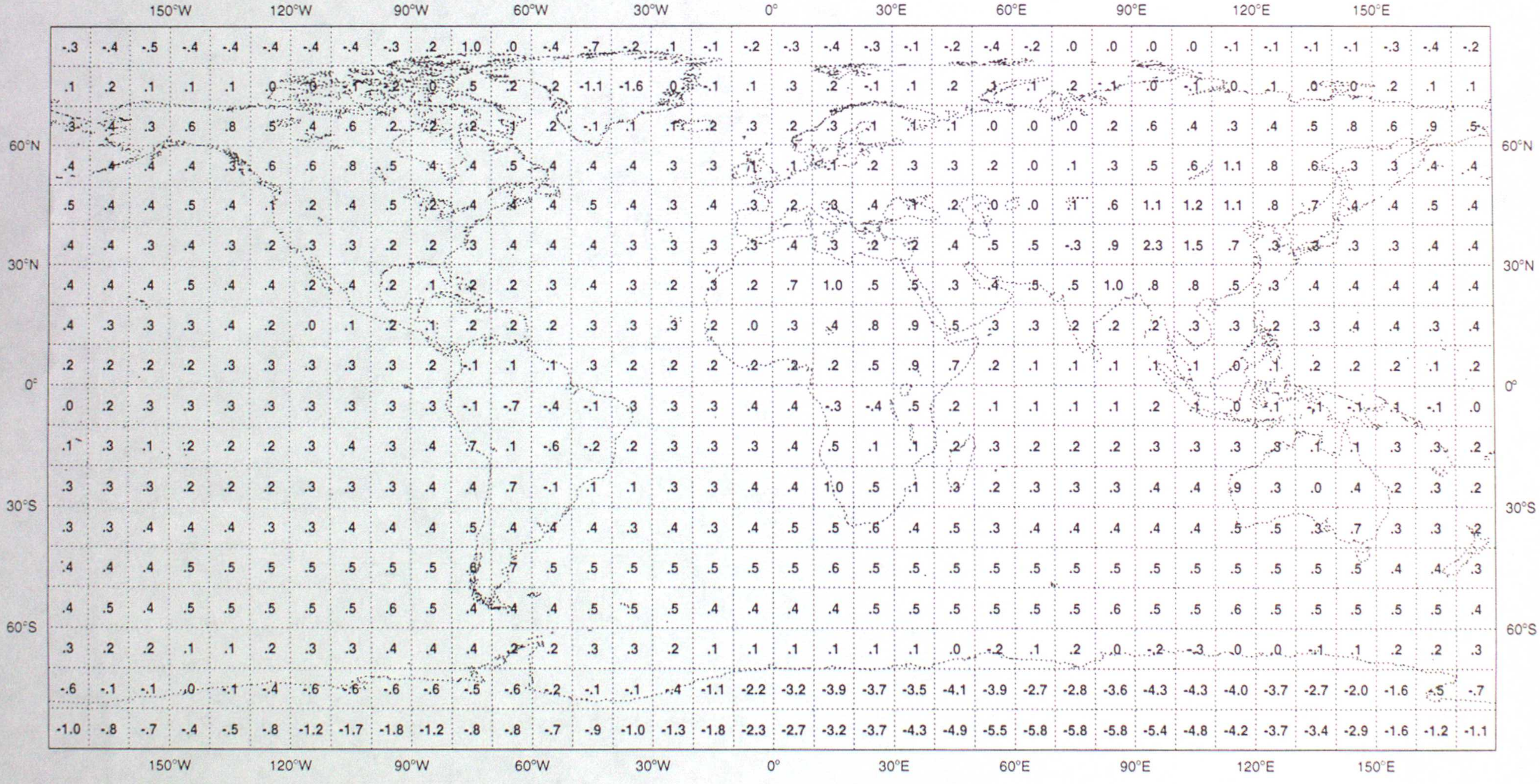


Figure 46. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

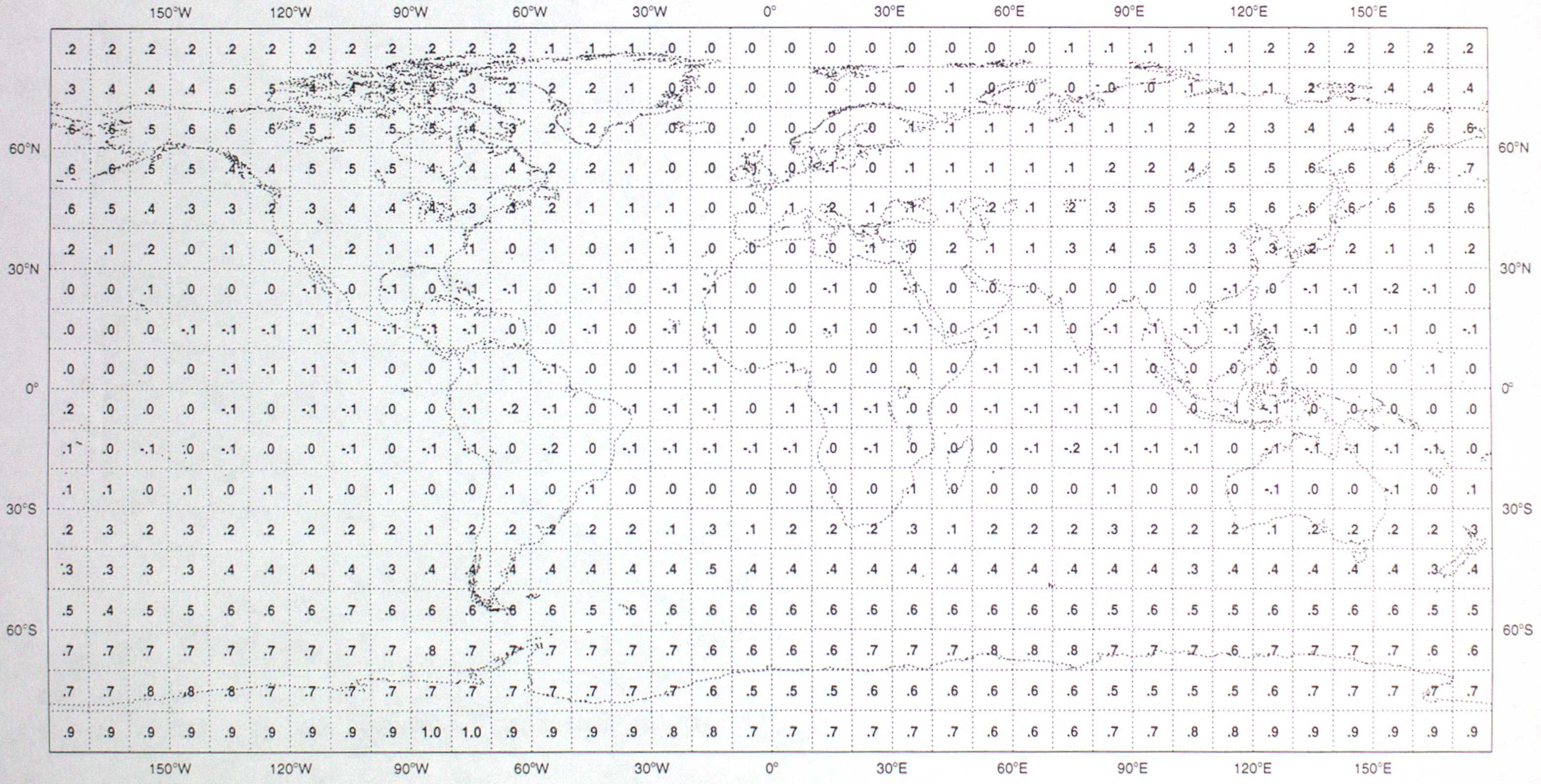
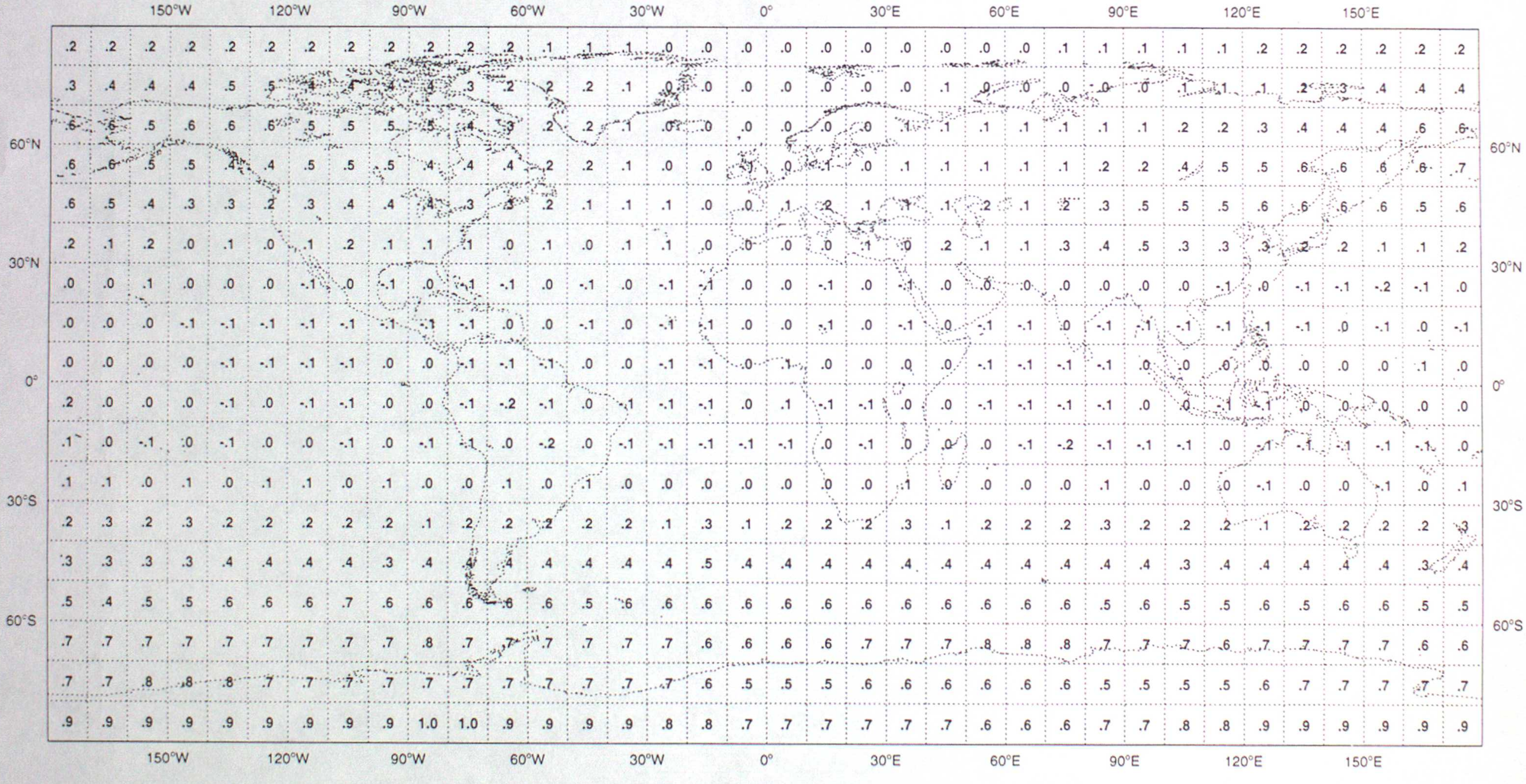
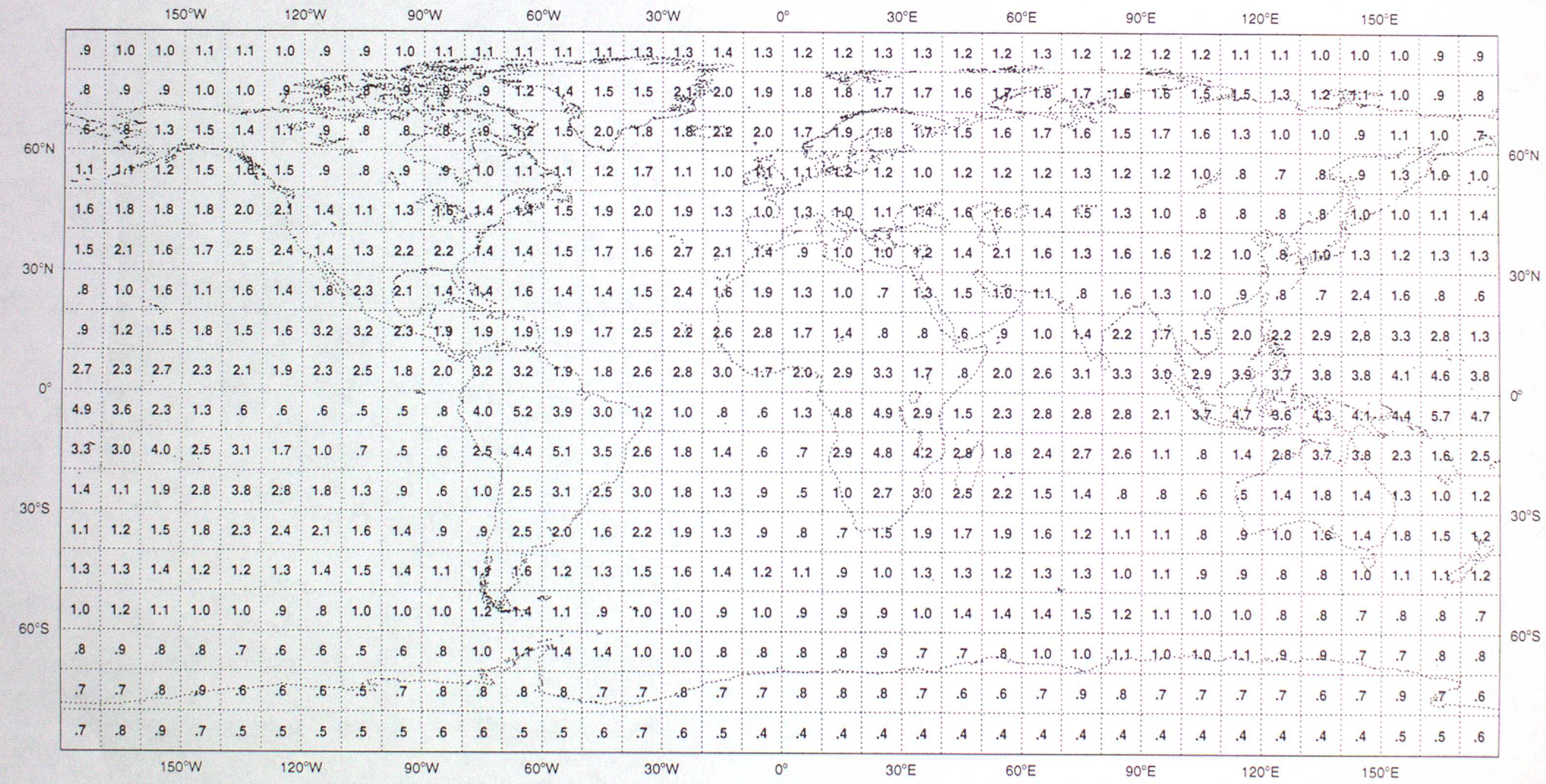


Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2
.3	.4	.4	.4	.5	.5	.4	.4	.4	.4	.3	.2	.2	.2	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.1	.1	.1	.2	.3	.4	.4	.4
.6	.6	.5	.6	.6	.6	.5	.5	.5	.5	.4	.3	.2	.2	.1	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.2	.2	.3	.4	.4	.4	.6	.6
.6	.6	.5	.5	.4	.4	.5	.5	.5	.4	.4	.4	.2	.2	.1	.0	.0	.1	.0	.1	.0	.1	.1	.1	.1	.1	.2	.2	.4	.5	.5	.6	.6	.6	.6	.7
.6	.5	.4	.3	.3	.2	.3	.4	.4	.4	.3	.3	.2	.1	.1	.1	.0	.0	.1	.2	.1	.1	.1	.2	.1	.2	.3	.5	.5	.5	.6	.6	.6	.6	.5	.6
.2	.1	.2	.0	.1	.0	.1	.2	.1	.1	.1	.0	.1	.0	.1	.1	.0	.0	.0	.0	.1	.0	.2	.1	.1	.3	.4	.5	.3	.3	.3	.2	.2	.1	.1	.2
.0	.0	.1	.0	.0	.0	-.1	.0	-.1	.0	-.1	-.1	.0	-.1	.0	-.1	-.1	.0	.0	-.1	.0	-.1	.0	.0	.0	.0	.0	.0	.0	-.1	.0	-.1	-.1	-.2	-.1	.0
.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	.0	.0	-.1	.0	-.1	-.1	.0	.0	-.1	.0	-.1	.0	-.1	-.1	.0	-.1	-.1	-.1	-.1	-.1	-.1	.0	-.1	.0	-.1
.0	.0	.0	.0	-.1	-.1	-.1	-.1	.0	.0	-.1	-.1	-.1	.0	.0	-.1	-.1	.0	.1	.0	.0	.0	.0	-.1	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.1	.0
.2	.0	.0	.0	-.1	.0	-.1	-.1	.0	.0	-.1	-.2	-.1	.0	-.1	-.1	-.1	.0	.1	-.1	-.1	.0	.0	-.1	-.1	-.1	-.1	.0	.0	-.1	-.1	.0	.0	.0	.0	.0
.1	.0	-.1	.0	-.1	.0	.0	-.1	.0	-.1	-.1	.0	-.2	.0	-.1	-.1	-.1	-.1	-.1	.0	-.1	.0	.0	.0	-.1	-.2	-.1	-.1	-.1	.0	-.1	-.1	-.1	-.1	-.1	.0
.1	.1	.0	.1	.0	.1	.1	.0	.1	.0	.0	.1	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0	.0	-.1	.0	.0	-.1	.0	.1
.2	.3	.2	.3	.2	.2	.2	.2	.2	.1	.2	.2	.2	.2	.2	.1	.3	.1	.2	.2	.2	.3	.1	.2	.2	.2	.3	.2	.2	.2	.1	.2	.2	.2	.2	.3
.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.3	.4
.5	.4	.5	.5	.6	.6	.6	.7	.6	.6	.6	.6	.6	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.6	.5	.5	.6	.5	.6	.6	.5	.5
.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.7	.7	.7	.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.8	.8	.8	.7	.7	.7	.6	.7	.7	.7	.7	.6	.6
.7	.7	.8	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.6	.5	.5	.5	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.6	.7	.7	.7	.7	.7
.9	.9	.9	.9	.9	.9	.9	.9	.9	1.0	1.0	.9	.9	.9	.9	.8	.8	.7	.7	.7	.7	.7	.7	.6	.6	.6	.7	.7	.8	.8	.9	.9	.9	.9	.9	.9

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

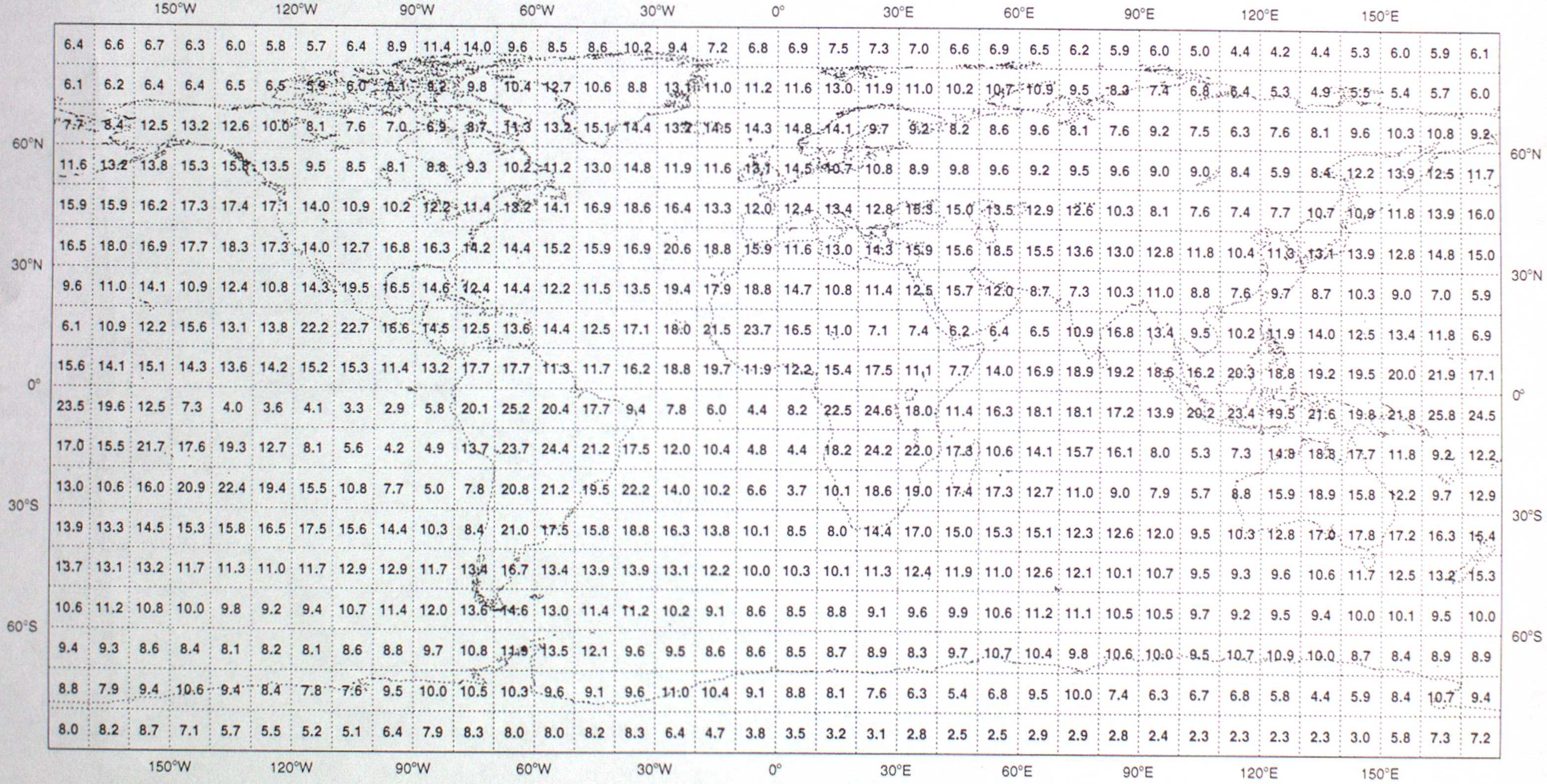


.9	1.0	1.0	1.1	1.1	1.0	.9	.9	1.0	1.1	1.1	1.1	1.1	1.1	1.3	1.3	1.4	1.3	1.2	1.2	1.3	1.3	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	.9	.9
.8	.9	.9	1.0	1.0	.9	.8	.8	.9	.9	.9	1.2	1.4	1.5	1.5	2.1	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.7	1.8	1.7	1.6	1.6	1.5	1.5	1.3	1.2	1.1	1.0	.9	.8
.6	.8	1.3	1.5	1.4	1.1	.9	.8	.8	.8	.9	1.2	1.5	2.0	1.8	1.8	2.2	2.0	1.7	1.9	1.8	1.7	1.5	1.6	1.7	1.6	1.5	1.7	1.6	1.3	1.0	1.0	.9	1.1	1.0	.7
1.1	1.1	1.2	1.5	1.6	1.5	.9	.8	.9	.9	1.0	1.1	1.1	1.2	1.7	1.1	1.0	1.1	1.1	1.2	1.2	1.0	1.2	1.2	1.2	1.3	1.2	1.2	1.0	.8	.7	.8	.9	1.3	1.0	1.0
1.6	1.8	1.8	1.8	2.0	2.1	1.4	1.1	1.3	1.5	1.4	1.4	1.5	1.9	2.0	1.9	1.3	1.0	1.3	1.0	1.1	1.4	1.6	1.6	1.4	1.5	1.3	1.0	.8	.8	.8	.8	1.0	1.0	1.1	1.4
1.5	2.1	1.6	1.7	2.5	2.4	1.4	1.3	2.2	2.2	1.4	1.4	1.5	1.7	1.6	2.7	2.1	1.4	.9	1.0	1.0	1.2	1.4	2.1	1.6	1.3	1.6	1.6	1.2	1.0	.8	1.0	1.3	1.2	1.3	1.3
.8	1.0	1.6	1.1	1.6	1.4	1.8	2.3	2.1	1.4	1.4	1.6	1.4	1.4	1.5	2.4	1.6	1.9	1.3	1.0	.7	1.3	1.5	1.0	1.1	.8	1.6	1.3	1.0	.9	.8	.7	2.4	1.6	.8	.6
.9	1.2	1.5	1.8	1.5	1.6	3.2	3.2	2.3	1.9	1.9	1.9	1.9	1.7	2.5	2.2	2.6	2.8	1.7	1.4	.8	.8	.6	.9	1.0	1.4	2.2	1.7	1.5	2.0	2.2	2.9	2,8	3.3	2.8	1.3
2.7	2.3	2.7	2.3	2.1	1.9	2.3	2.5	1.8	2.0	3.2	3.2	1.9	1.8	2.6	2.8	3.0	1.7	2.0	2.9	3.3	1.7	.8	2.0	2.6	3.1	3.3	3.0	2.9	3.9	3.7	3.8	3.8	4.1	4.6	3.8
4.9	3.6	2.3	1.3	.6	.6	.6	.5	.5	.8	4.0	5.2	3.9	3.0	1.2	1.0	.8	.6	1.3	4.8	4.9	2.9	1.5	2.3	2.8	2.8	2.8	2.1	3.7	4.7	3.6	4.3	4.1	4.4	5.7	4.7
3.3	3.0	4.0	2.5	3.1	1.7	1.0	.7	.5	.6	2.5	4.4	5.1	3.5	2.6	1.8	1.4	.6	.7	2.9	4.8	4.2	2.8	1.8	2.4	2.7	2.6	1.1	.8	1.4	2.8	3.7	3.8	2.3	1.6	2.5
1.4	1.1	1.9	2.8	3.8	2.8	1.8	1.3	.9	.6	1.0	2.5	3.1	2.5	3.0	1.8	1.3	.9	.5	1.0	2.7	3.0	2.5	2.2	1.5	1.4	.8	.8	.6	.5	1.4	1.8	1.4	1.3	1.0	1.2
1.1	1.2	1.5	1.8	2.3	2.4	2.1	1.6	1.4	.9	.9	2.5	2.0	1.6	2.2	1.9	1.3	.9	.8	.7	1.5	1.9	1.7	1.9	1.6	1.2	1.1	1.1	.8	.9	1.0	1.6	1.4	1.8	1.5	1.2
1.3	1.3	1.4	1.2	1.2	1.3	1.4	1.5	1.4	1.1	1.1	1.6	1.2	1.3	1.5	1.6	1.4	1.2	1.1	.9	1.0	1.3	1.3	1.2	1.3	1.3	1.0	1.1	.9	.9	.8	.8	1.0	1.1	1.1	1.2
1.0	1.2	1.1	1.0	1.0	.9	.8	1.0	1.0	1.0	1.2	1.4	1.1	.9	1.0	1.0	.9	1.0	.9	.9	.9	1.0	1.4	1.4	1.4	1.5	1.2	1.1	1.0	1.0	.8	.8	.7	.8	.8	.7
.8	.9	.8	.8	.7	.6	.6	.5	.6	.8	1.0	1.1	1.4	1.4	1.0	1.0	.8	.8	.8	.8	.9	.7	.7	.8	1.0	1.0	1.1	1.0	1.0	1.1	.9	.9	.7	.7	.8	.8
.7	.7	.8	.9	.6	.6	.6	.5	.7	.8	.8	.8	.8	.7	.7	.8	.7	.7	.8	.8	.8	.7	.6	.6	.7	.9	.8	.7	.7	.7	.7	.6	.7	.9	.7	.6
.7	.8	.9	.7	.5	.5	.5	.5	.5	.6	.6	.5	.5	.6	.7	.6	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.6

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001

Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations

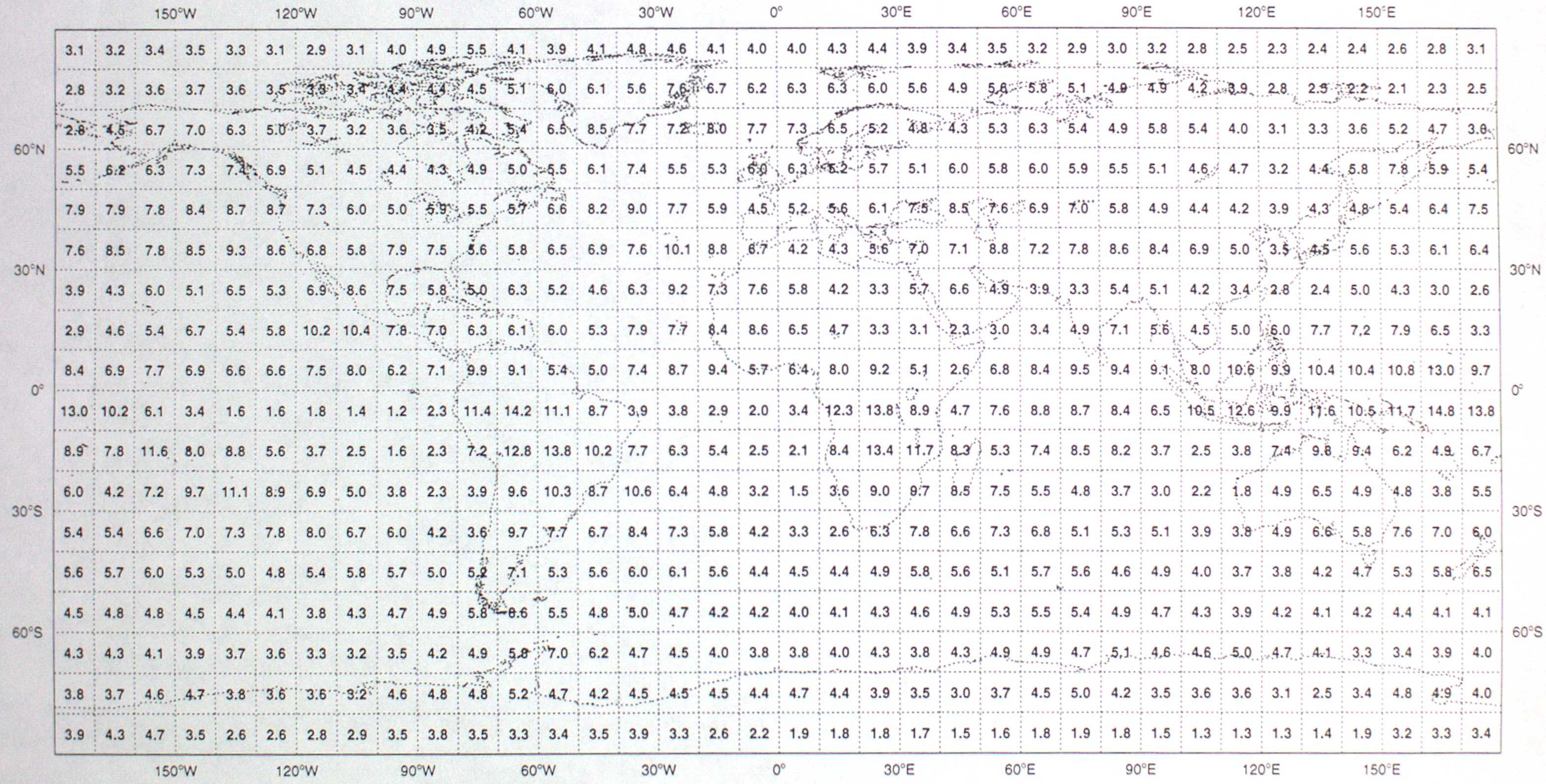


6.4	6.6	6.7	6.3	6.0	5.8	5.7	6.4	8.9	11.4	14.0	9.6	8.5	8.6	10.2	9.4	7.2	6.8	6.9	7.5	7.3	7.0	6.6	6.9	6.5	6.2	5.9	6.0	5.0	4.4	4.2	4.4	5.3	6.0	5.9	6.1
6.1	6.2	6.4	6.4	6.5	6.5	5.9	6.0	8.1	8.2	9.8	10.4	12.7	10.6	8.8	13.1	11.0	11.2	11.6	13.0	11.9	11.0	10.2	10.7	10.9	9.5	8.3	7.4	6.8	6.4	5.3	4.9	5.5	5.4	5.7	6.0
7.7	8.4	12.5	13.2	12.6	10.0	8.1	7.6	7.0	6.9	8.7	11.3	13.2	15.1	14.4	13.2	14.5	14.3	14.8	14.1	9.7	9.2	8.2	8.6	9.6	8.1	7.6	9.2	7.5	6.3	7.6	8.1	9.6	10.3	10.8	9.2
11.6	13.2	13.8	15.3	15.8	13.5	9.5	8.5	8.1	8.8	9.3	10.2	11.2	13.0	14.8	11.9	11.6	13.1	14.5	10.7	10.8	8.9	9.8	9.6	9.2	9.5	9.6	9.0	9.0	8.4	5.9	8.4	12.2	13.9	12.5	11.7
15.9	15.9	16.2	17.3	17.4	17.1	14.0	10.9	10.2	12.2	11.4	18.2	14.1	16.9	18.6	16.4	13.3	12.0	12.4	13.4	12.8	15.3	15.0	13.5	12.9	12.6	10.3	8.1	7.6	7.4	7.7	10.7	10.9	11.8	13.9	16.0
16.5	18.0	16.9	17.7	18.3	17.3	14.0	12.7	16.8	16.3	14.2	14.4	15.2	15.9	16.9	20.6	18.8	15.9	11.6	13.0	14.3	15.9	15.6	18.5	15.5	13.6	13.0	12.8	11.8	10.4	11.3	13.1	13.9	12.8	14.8	15.0
9.6	11.0	14.1	10.9	12.4	10.8	14.3	19.5	16.5	14.6	12.4	14.4	12.2	11.5	13.5	19.4	17.9	18.8	14.7	10.8	11.4	12.5	15.7	12.0	8.7	7.3	10.3	11.0	8.8	7.6	9.7	8.7	10.3	9.0	7.0	5.9
6.1	10.9	12.2	15.6	13.1	13.8	22.2	22.7	16.6	14.5	12.5	13.6	14.4	12.5	17.1	18.0	21.5	23.7	16.5	11.0	7.1	7.4	6.2	6.4	6.5	10.9	16.8	13.4	9.5	10.2	11.9	14.0	12.5	13.4	11.8	6.9
15.6	14.1	15.1	14.3	13.6	14.2	15.2	15.3	11.4	13.2	17.7	17.7	11.3	11.7	16.2	18.8	19.7	11.9	12.2	15.4	17.5	11.1	7.7	14.0	16.9	18.9	19.2	18.6	16.2	20.3	18.8	19.2	19.5	20.0	21.9	17.1
23.5	19.6	12.5	7.3	4.0	3.6	4.1	3.3	2.9	5.8	20.1	25.2	20.4	17.7	9.4	7.8	6.0	4.4	8.2	22.5	24.6	18.0	11.4	16.3	18.1	18.1	17.2	13.9	20.2	23.4	19.5	21.6	19.8	21.8	25.8	24.5
17.0	15.5	21.7	17.6	19.3	12.7	8.1	5.6	4.2	4.9	13.7	23.7	24.4	21.2	17.5	12.0	10.4	4.8	4.4	18.2	24.2	22.0	17.3	10.6	14.1	15.7	16.1	8.0	5.3	7.3	14.8	18.8	17.7	11.8	9.2	12.2
13.0	10.6	16.0	20.9	22.4	19.4	15.5	10.8	7.7	5.0	7.8	20.8	21.2	19.5	22.2	14.0	10.2	6.6	3.7	10.1	18.6	19.0	17.4	17.3	12.7	11.0	9.0	7.9	5.7	8.8	15.9	18.9	15.8	12.2	9.7	12.9
13.9	13.3	14.5	15.3	15.8	16.5	17.5	15.6	14.4	10.3	8.4	21.0	17.5	15.8	18.8	16.3	13.8	10.1	8.5	8.0	14.4	17.0	15.0	15.3	15.1	12.3	12.6	12.0	9.5	10.3	12.8	17.0	17.8	17.2	16.3	15.4
13.7	13.1	13.2	11.7	11.3	11.0	11.7	12.9	12.9	11.7	13.4	16.7	13.4	13.9	13.9	13.1	12.2	10.0	10.3	10.1	11.3	12.4	11.9	11.0	12.6	12.1	10.1	10.7	9.5	9.3	9.6	10.6	11.7	12.5	13.2	15.3
10.6	11.2	10.8	10.0	9.8	9.2	9.4	10.7	11.4	12.0	13.6	14.6	13.0	11.4	11.2	10.2	9.1	8.6	8.5	8.8	9.1	9.6	9.9	10.6	11.2	11.1	10.5	10.5	9.7	9.2	9.5	9.4	10.0	10.1	9.5	10.0
9.4	9.3	8.6	8.4	8.1	8.2	8.1	8.6	8.8	9.7	10.8	11.9	13.5	12.1	9.6	9.5	8.6	8.6	8.5	8.7	8.9	8.3	9.7	10.7	10.4	9.8	10.6	10.0	9.5	10.7	10.9	10.0	8.7	8.4	8.9	8.9
8.8	7.9	9.4	10.6	9.4	8.4	7.8	7.6	9.5	10.0	10.5	10.3	9.6	9.1	9.6	11.0	10.4	9.1	8.8	8.1	7.6	6.3	5.4	6.8	9.5	10.0	7.4	6.3	6.7	6.8	5.8	4.4	5.9	8.4	10.7	9.4
8.0	8.2	8.7	7.1	5.7	5.5	5.2	5.1	6.4	7.9	8.3	8.0	8.0	8.2	8.3	6.4	4.7	3.8	3.5	3.2	3.1	2.8	2.5	2.5	2.9	2.9	2.8	2.4	2.3	2.3	2.3	2.3	3.0	5.8	7.3	7.2

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001

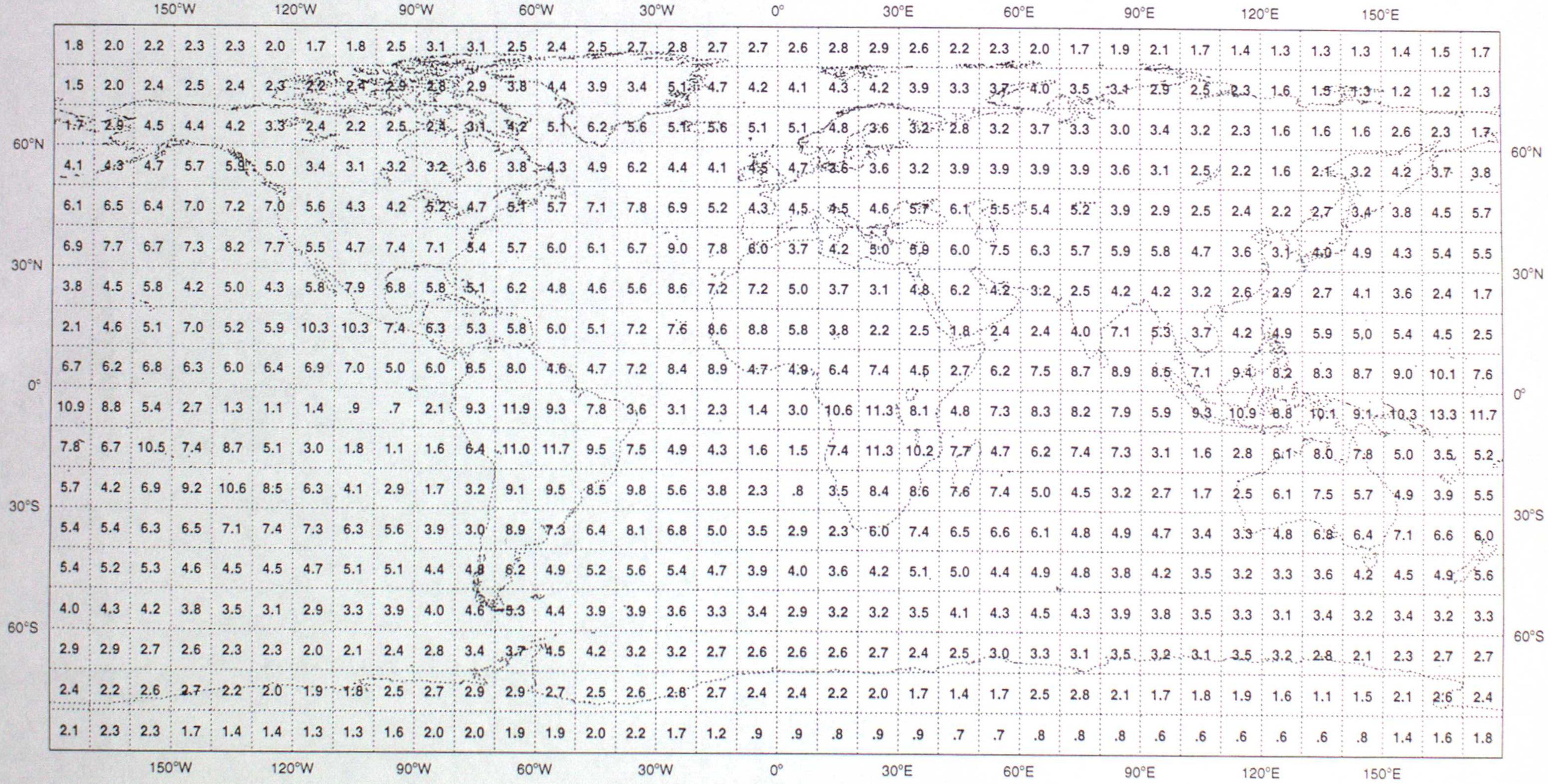
Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations



3.1	3.2	3.4	3.5	3.3	3.1	2.9	3.1	4.0	4.9	5.5	4.1	3.9	4.1	4.8	4.6	4.1	4.0	4.0	4.3	4.4	3.9	3.4	3.5	3.2	2.9	3.0	3.2	2.8	2.5	2.3	2.4	2.4	2.6	2.8	3.1
2.8	3.2	3.6	3.7	3.6	3.5	3.8	3.4	4.4	4.4	4.5	5.1	6.0	6.1	5.6	7.6	6.7	6.2	6.3	6.3	6.0	5.6	4.9	5.6	5.8	5.1	4.9	4.9	4.2	3.9	2.8	2.5	2.2	2.1	2.3	2.5
2.8	4.5	6.7	7.0	6.3	5.0	3.7	3.2	3.6	3.5	4.2	5.4	6.5	8.5	7.7	7.2	8.0	7.7	7.3	6.5	5.2	4.8	4.3	5.3	6.3	5.4	4.9	5.8	5.4	4.0	3.1	3.3	3.6	5.2	4.7	3.8
5.5	6.2	6.3	7.3	7.4	6.9	5.1	4.5	4.4	4.3	4.9	5.0	5.5	6.1	7.4	5.5	5.3	6.0	6.3	5.2	5.7	5.1	6.0	5.8	6.0	5.9	5.5	5.1	4.6	4.7	3.2	4.4	5.8	7.8	5.9	5.4
7.9	7.9	7.8	8.4	8.7	8.7	7.3	6.0	5.0	5.9	5.5	5.7	6.6	8.2	9.0	7.7	5.9	4.5	5.2	5.6	6.1	7.5	8.5	7.6	6.9	7.0	5.8	4.9	4.4	4.2	3.9	4.3	4.8	5.4	6.4	7.5
7.6	8.5	7.8	8.5	9.3	8.6	6.8	5.8	7.9	7.5	5.6	5.8	6.5	6.9	7.6	10.1	8.8	6.7	4.2	4.3	5.6	7.0	7.1	8.8	7.2	7.8	8.6	8.4	6.9	5.0	3.5	4.5	5.6	5.3	6.1	6.4
3.9	4.3	6.0	5.1	6.5	5.3	6.9	8.6	7.5	5.8	5.0	6.3	5.2	4.6	6.3	9.2	7.3	7.6	5.8	4.2	3.3	5.7	6.6	4.9	3.9	3.3	5.4	5.1	4.2	3.4	2.8	2.4	5.0	4.3	3.0	2.6
2.9	4.6	5.4	6.7	5.4	5.8	10.2	10.4	7.8	7.0	6.3	6.1	6.0	5.3	7.9	7.7	8.4	8.6	6.5	4.7	3.3	3.1	2.3	3.0	3.4	4.9	7.1	5.6	4.5	5.0	6.0	7.7	7.2	7.9	6.5	3.3
8.4	6.9	7.7	6.9	6.6	6.6	7.5	8.0	6.2	7.1	9.9	9.1	5.4	5.0	7.4	8.7	9.4	5.7	6.4	8.0	9.2	5.1	2.6	6.8	8.4	9.5	9.4	9.1	8.0	10.6	9.9	10.4	10.4	10.8	13.0	9.7
13.0	10.2	6.1	3.4	1.6	1.6	1.8	1.4	1.2	2.3	11.4	14.2	11.1	8.7	3.9	3.8	2.9	2.0	3.4	12.3	13.8	8.9	4.7	7.6	8.8	8.7	8.4	6.5	10.5	12.6	9.9	11.6	10.5	11.7	14.8	13.8
8.9	7.8	11.6	8.0	8.8	5.6	3.7	2.5	1.6	2.3	7.2	12.8	13.8	10.2	7.7	6.3	5.4	2.5	2.1	8.4	13.4	11.7	8.3	5.3	7.4	8.5	8.2	3.7	2.5	3.8	7.4	9.8	9.4	6.2	4.9	6.7
6.0	4.2	7.2	9.7	11.1	8.9	6.9	5.0	3.8	2.3	3.9	9.6	10.3	8.7	10.6	6.4	4.8	3.2	1.5	3.6	9.0	9.7	8.5	7.5	5.5	4.8	3.7	3.0	2.2	1.8	4.9	6.5	4.9	4.8	3.8	5.5
5.4	5.4	6.6	7.0	7.3	7.8	8.0	6.7	6.0	4.2	3.6	9.7	7.7	6.7	8.4	7.3	5.8	4.2	3.3	2.6	6.3	7.8	6.6	7.3	6.8	5.1	5.3	5.1	3.9	3.8	4.9	6.6	5.8	7.6	7.0	6.0
5.6	5.7	6.0	5.3	5.0	4.8	5.4	5.8	5.7	5.0	5.2	7.1	5.3	5.6	6.0	6.1	5.6	4.4	4.5	4.4	4.9	5.8	5.6	5.1	5.7	5.6	4.6	4.9	4.0	3.7	3.8	4.2	4.7	5.3	5.8	6.5
4.5	4.8	4.8	4.5	4.4	4.1	3.8	4.3	4.7	4.9	5.8	6.6	5.5	4.8	5.0	4.7	4.2	4.2	4.0	4.1	4.3	4.6	4.9	5.3	5.5	5.4	4.9	4.7	4.3	3.9	4.2	4.1	4.2	4.4	4.1	4.1
4.3	4.3	4.1	3.9	3.7	3.6	3.3	3.2	3.5	4.2	4.9	5.8	7.0	6.2	4.7	4.5	4.0	3.8	3.8	4.0	4.3	3.8	4.3	4.9	4.9	4.7	5.1	4.6	4.6	5.0	4.7	4.1	3.3	3.4	3.9	4.0
3.8	3.7	4.6	4.7	3.8	3.6	3.6	3.2	4.6	4.8	4.8	5.2	4.7	4.2	4.5	4.5	4.5	4.4	4.7	4.4	3.9	3.5	3.0	3.7	4.5	5.0	4.2	3.5	3.6	3.6	3.1	2.5	3.4	4.8	4.9	4.0
3.9	4.3	4.7	3.5	2.6	2.6	2.8	2.9	3.5	3.8	3.5	3.3	3.4	3.5	3.9	3.3	2.6	2.2	1.9	1.8	1.8	1.7	1.5	1.6	1.8	1.9	1.8	1.5	1.3	1.3	1.3	1.4	1.9	3.2	3.3	3.4

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



1.8	2.0	2.2	2.3	2.3	2.0	1.7	1.8	2.5	3.1	3.1	2.5	2.4	2.5	2.7	2.8	2.7	2.7	2.6	2.8	2.9	2.6	2.2	2.3	2.0	1.7	1.9	2.1	1.7	1.4	1.3	1.3	1.3	1.4	1.5	1.7
1.5	2.0	2.4	2.5	2.4	2.3	2.2	2.4	2.9	2.8	2.9	3.8	4.4	3.9	3.4	5.1	4.7	4.2	4.1	4.3	4.2	3.9	3.3	3.7	4.0	3.5	3.4	2.9	2.5	2.3	1.6	1.5	1.3	1.2	1.2	1.3
1.7	2.9	4.5	4.4	4.2	3.3	2.4	2.2	2.5	2.4	3.1	4.2	5.1	6.2	5.6	5.1	5.6	5.1	5.1	4.8	3.6	3.2	2.8	3.2	3.7	3.3	3.0	3.4	3.2	2.3	1.6	1.6	1.6	2.6	2.3	1.7
4.1	4.3	4.7	5.7	5.9	5.0	3.4	3.1	3.2	3.2	3.6	3.8	4.3	4.9	6.2	4.4	4.1	4.5	4.7	3.6	3.6	3.2	3.9	3.9	3.9	3.9	3.6	3.1	2.5	2.2	1.6	2.1	3.2	4.2	3.7	3.8
6.1	6.5	6.4	7.0	7.2	7.0	5.6	4.3	4.2	5.2	4.7	5.1	5.7	7.1	7.8	6.9	5.2	4.3	4.5	4.5	4.6	5.7	6.1	5.5	5.4	5.2	3.9	2.9	2.5	2.4	2.2	2.7	3.4	3.8	4.5	5.7
6.9	7.7	6.7	7.3	8.2	7.7	5.5	4.7	7.4	7.1	5.4	5.7	6.0	6.1	6.7	9.0	7.8	6.0	3.7	4.2	5.0	5.9	6.0	7.5	6.3	5.7	5.9	5.8	4.7	3.6	3.1	4.0	4.9	4.3	5.4	5.5
3.8	4.5	5.8	4.2	5.0	4.3	5.8	7.9	6.8	5.8	5.1	6.2	4.8	4.6	5.6	8.6	7.2	7.2	5.0	3.7	3.1	4.8	6.2	4.2	3.2	2.5	4.2	4.2	3.2	2.6	2.9	2.7	4.1	3.6	2.4	1.7
2.1	4.6	5.1	7.0	5.2	5.9	10.3	10.3	7.4	6.3	5.3	5.8	6.0	5.1	7.2	7.6	8.6	8.8	5.8	3.8	2.2	2.5	1.8	2.4	2.4	4.0	7.1	5.3	3.7	4.2	4.9	5.9	5.0	5.4	4.5	2.5
6.7	6.2	6.8	6.3	6.0	6.4	6.9	7.0	5.0	6.0	8.5	8.0	4.6	4.7	7.2	8.4	8.9	4.7	4.9	6.4	7.4	4.5	2.7	6.2	7.5	8.7	8.9	8.5	7.1	9.4	8.2	8.3	8.7	9.0	10.1	7.6
10.9	8.8	5.4	2.7	1.3	1.1	1.4	.9	.7	2.1	9.3	11.9	9.3	7.8	3.6	3.1	2.3	1.4	3.0	10.6	11.3	8.1	4.8	7.3	8.3	8.2	7.9	5.9	9.3	10.9	8.8	10.1	9.1	10.3	13.3	11.7
7.8	6.7	10.5	7.4	8.7	5.1	3.0	1.8	1.1	1.6	6.4	11.0	11.7	9.5	7.5	4.9	4.3	1.6	1.5	7.4	11.3	10.2	7.7	4.7	6.2	7.4	7.3	3.1	1.6	2.8	6.1	8.0	7.8	5.0	3.5	5.2
5.7	4.2	6.9	9.2	10.6	8.5	6.3	4.1	2.9	1.7	3.2	9.1	9.5	8.5	9.8	5.6	3.8	2.3	.8	3.5	8.4	8.6	7.6	7.4	5.0	4.5	3.2	2.7	1.7	2.5	6.1	7.5	5.7	4.9	3.9	5.5
5.4	5.4	6.3	6.5	7.1	7.4	7.3	6.3	5.6	3.9	3.0	8.9	7.3	6.4	8.1	6.8	5.0	3.5	2.9	2.3	6.0	7.4	6.5	6.6	6.1	4.8	4.9	4.7	3.4	3.3	4.8	6.8	6.4	7.1	6.6	6.0
5.4	5.2	5.3	4.6	4.5	4.5	4.7	5.1	5.1	4.4	4.8	6.2	4.9	5.2	5.6	5.4	4.7	3.9	4.0	3.6	4.2	5.1	5.0	4.4	4.9	4.8	3.8	4.2	3.5	3.2	3.3	3.6	4.2	4.5	4.9	5.6
4.0	4.3	4.2	3.8	3.5	3.1	2.9	3.3	3.9	4.0	4.6	5.3	4.4	3.9	3.9	3.6	3.3	3.4	2.9	3.2	3.2	3.5	4.1	4.3	4.5	4.3	3.9	3.8	3.5	3.3	3.1	3.4	3.2	3.4	3.2	3.3
2.9	2.9	2.7	2.6	2.3	2.3	2.0	2.1	2.4	2.8	3.4	3.7	4.5	4.2	3.2	3.2	2.7	2.6	2.6	2.6	2.7	2.4	2.5	3.0	3.3	3.1	3.5	3.2	3.1	3.5	3.2	2.8	2.1	2.3	2.7	2.7
2.4	2.2	2.6	2.7	2.2	2.0	1.9	1.8	2.5	2.7	2.9	2.9	2.7	2.5	2.6	2.8	2.7	2.4	2.4	2.2	2.0	1.7	1.4	1.7	2.5	2.8	2.1	1.7	1.8	1.9	1.6	1.1	1.5	2.1	2.6	2.4
2.1	2.3	2.3	1.7	1.4	1.4	1.3	1.3	1.6	2.0	2.0	1.9	1.9	2.0	2.2	1.7	1.2	.9	.9	.8	.9	.9	.7	.7	.8	.8	.8	.6	.6	.6	.6	.6	.8	1.4	1.6	1.8

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

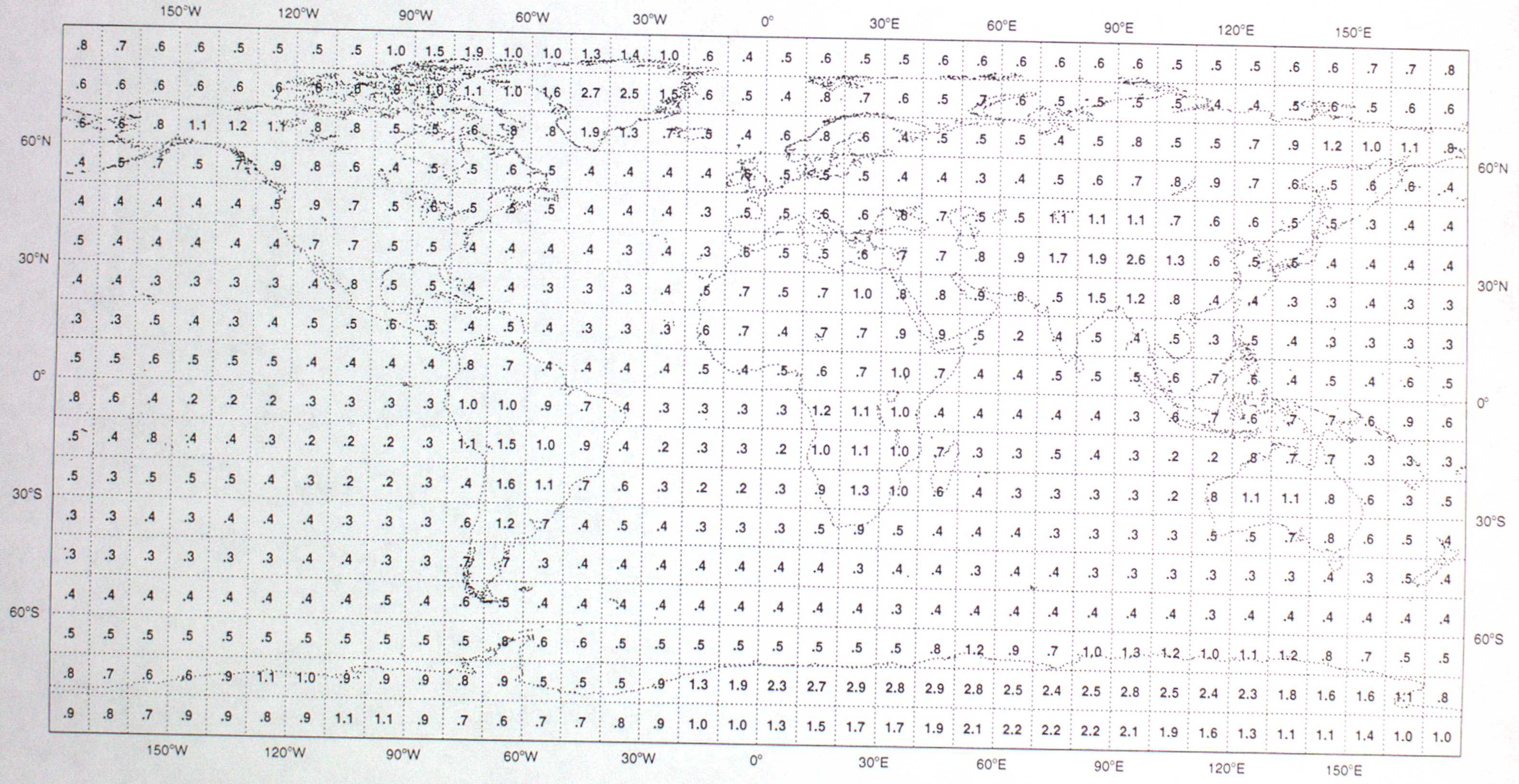


Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

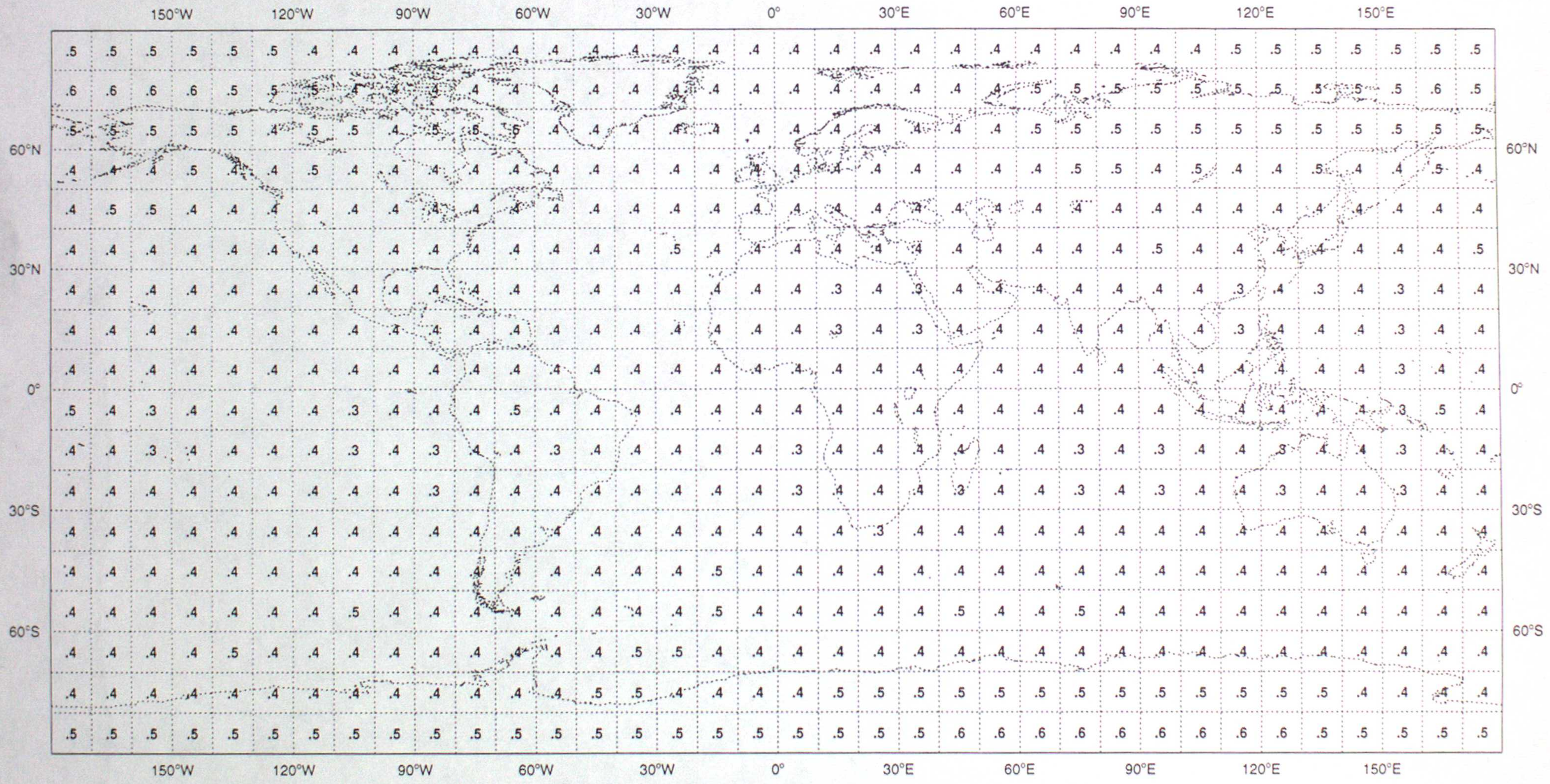


Figure 54. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2001
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

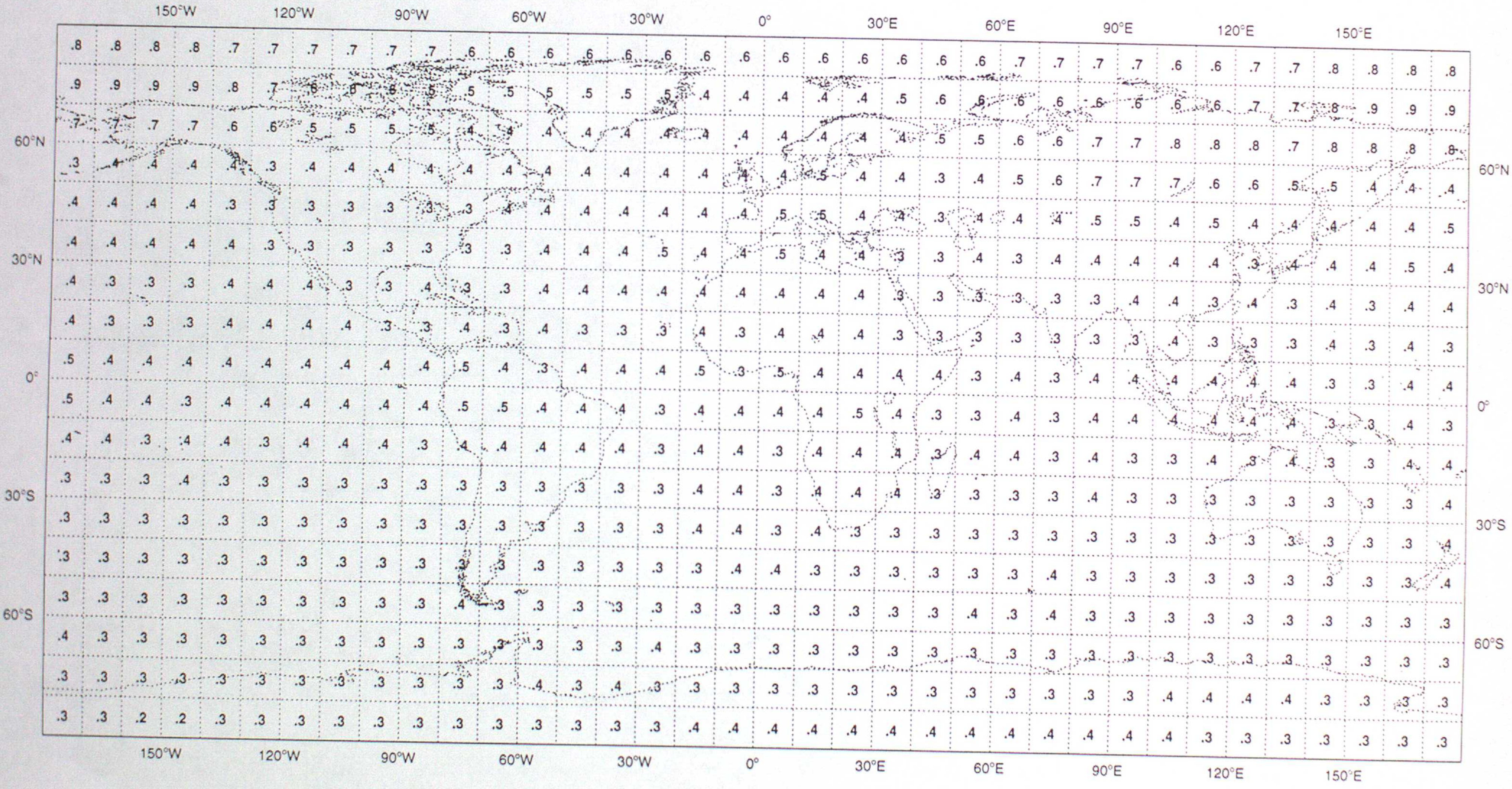


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed ($m\ s^{-1}$) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 $m\ s^{-1}$ (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

MEAN SEA LEVEL PRESSURE

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
12518	40.1	-15.3	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
15581	57.8	-24.3	ALL	P	SUR	1	0	0	0.0	0.1	0.1
40656	32.3	-79.6	ALL	P	SUR	1	0	0	0.0	1.3	1.3
41523	32.2	-47.6	ALL	P	SUR	391	0	0	1.3	0.6	1.4
41552	20.8	-46.0	ALL	P	SUR	624	0	0	0.7	-0.9	1.2
41553	19.3	-62.8	ALL	P	SUR	637	0	0	0.6	-0.2	0.6
41554	21.3	-64.3	ALL	P	SUR	638	0	0	0.6	-0.4	0.7
41556	16.6	-60.6	ALL	P	SUR	627	0	0	0.6	-0.3	0.7
41557	20.4	-55.8	ALL	P	SUR	637	0	0	0.7	-0.3	0.8
41559	17.5	-55.9	ALL	P	SUR	626	0	0	0.7	-0.4	0.8
41560	14.3	-51.5	ALL	P	SUR	585	0	0	0.6	-0.5	0.8
41561	17.8	-53.7	ALL	P	SUR	616	0	0	0.7	-0.7	0.9
41563	14.1	-39.9	ALL	P	SUR	596	0	0	0.6	-0.4	0.7
41639	28.1	-59.4	ALL	P	SUR	195	0	0	1.9	1.4	2.4
41642	24.3	-66.7	ALL	P	SUR	275	0	0	1.3	0.4	1.4
41645	30.0	-78.0	ALL	P	SUR	630	0	0	0.8	1.1	1.4
41646	27.9	-77.9	ALL	P	SUR	613	0	0	1.0	0.6	1.1
41647	24.2	-70.8	ALL	P	SUR	616	0	0	0.8	0.2	0.8
41648	23.1	-73.2	ALL	P	SUR	776	0	0	0.8	0.4	0.8
41650	22.6	-72.4	ALL	P	SUR	620	0	0	0.7	0.7	1.0
41651	24.3	-75.4	ALL	P	SUR	653	0	0	1.0	0.7	1.2
41652	29.3	-63.6	ALL	P	SUR	798	0	0	1.3	-0.2	1.3
41655	31.4	-80.3	ALL	P	SUR	604	0	0	0.7	0.4	0.8
41656	32.3	-79.6	ALL	P	SUR	607	1	0	0.9	0.6	1.0
41657	37.0	-73.0	ALL	P	SUR	593	0	0	0.7	0.3	0.8
41658	39.1	-65.5	ALL	P	SUR	605	0	0	0.8	-0.6	1.0
41659	36.5	-75.3	ALL	P	SUR	612	0	0	0.6	1.3	1.4
42518	41.1	-14.7	ALL	P	SUR	1	0	0	0.0	0.5	0.5
44545	61.6	-26.4	ALL	P	SUR	1	0	0	0.0	-1.7	1.7
44546	62.1	-22.1	ALL	P	SUR	1401	0	0	1.2	-0.6	1.3
44548	51.7	-15.0	ALL	P	SUR	680	0	0	0.7	0.3	0.7
44549	51.7	-35.3	ALL	P	SUR	1211	0	0	1.4	0.3	1.4
44550	48.3	-35.0	ALL	P	SUR	1669	2	0	1.0	-0.2	1.1
44611	54.7	-34.1	ALL	P	SUR	1	0	0	0.0	2.0	2.0
44612	30.9	-26.0	ALL	P	SUR	893	0	0	0.6	-0.3	0.7
44613	29.3	-22.2	ALL	P	SUR	651	0	0	0.7	-0.1	0.7
44616	46.4	-39.3	ALL	P	SUR	1096	3	0	1.3	0.9	1.5
44621	54.8	-33.7	ALL	P	SUR	1328	1	0	1.0	0.2	1.0
44623	33.3	-25.7	ALL	P	SUR	988	0	0	0.7	0.2	0.7
44624	43.8	-43.4	ALL	P	SUR	687	1	0	1.4	0.1	1.4
44625	44.8	-55.7	ALL	P	SUR	1256	69	5	2.3	-1.0	2.5
44627	43.8	-42.2	ALL	P	SUR	970	9	1	1.3	-0.5	1.4
44628	44.7	-38.5	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
44686	47.2	-39.5	ALL	P	SUR	1	0	0	0.0	0.1	0.1
44721	35.6	-30.1	ALL	P	SUR	918	0	0	1.0	0.0	1.0
44722	35.1	-34.6	ALL	P	SUR	194	85	44	0.7	-0.5	0.9
44723	49.6	-45.6	ALL	P	SUR	1196	0	0	1.2	-0.1	1.2
44726	57.0	-36.7	ALL	P	SUR	1340	1	0	1.6	0.3	1.6
44728	52.8	-47.3	ALL	P	SUR	1082	5	0	1.3	-0.5	1.4
44729	39.4	-14.3	ALL	P	SUR	878	0	0	0.6	0.6	0.8
44730	53.2	-42.8	ALL	P	SUR	1114	1	0	1.4	-0.2	1.4
44742	55.2	-36.3	ALL	P	SUR	992	6	1	1.4	1.3	1.9
44761	59.1	-5.9	ALL	P	SUR	1228	0	0	0.7	-0.2	0.8
44765	34.5	-31.0	ALL	P	SUR	569	1	0	0.9	-0.2	0.9
44771	58.1	-20.2	ALL	P	SUR	1015	0	0	1.2	0.3	1.2
44772	57.5	-21.4	ALL	P	SUR	1	0	0	0.0	0.5	0.5
44775	30.8	-38.2	ALL	P	SUR	927	0	0	1.7	-0.6	1.8
44776	57.2	-14.9	ALL	P	SUR	1290	0	0	0.8	-0.3	0.9
44778	41.9	-21.2	ALL	P	SUR	984	0	0	0.8	-0.1	0.8
44779	30.7	-38.4	ALL	P	SUR	1	0	0	0.0	-1.1	1.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS

MEAN SEA LEVEL PRESSURE

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
44807	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
44823	50.0	-46.2	ALL	P	SUR	1	0	0	0.0	0.6	0.6
44825	40.3	-73.2	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
44946	61.9	-23.3	ALL	P	SUR	1	0	0	0.0	5.1	5.1
45749	45.5	-82.1	ALL	P	SUR	1	0	0	0.0	4.0	4.0
45808	44.3	-83.4	ALL	P	SUR	1	0	0	0.0	0.8	0.8
45832	42.5	-81.2	ALL	P	SUR	1	0	0	0.0	2.7	2.7
47556	74.0	-76.7	ALL	P	SUR	573	1	0	0.8	-0.1	0.8
47956	71.9	-71.9	ALL	P	SUR	1	0	0	0.0	-0.2	0.2
62501	31.8	-19.4	ALL	P	SUR	818	1	0	0.7	0.3	0.7
62503	31.8	-15.1	ALL	P	SUR	855	0	0	0.5	-0.4	0.7
62504	37.4	-22.7	ALL	P	SUR	1038	0	0	0.6	-0.2	0.7
62510	41.4	-17.8	ALL	P	SUR	24	15	63	1.5	-12.9	13.0
62511	38.7	-25.0	ALL	P	SUR	333	0	0	0.6	-0.4	0.7
62512	41.3	-17.1	ALL	P	SUR	1170	0	0	0.8	-0.8	1.2
62514	58.6	-6.6	ALL	P	SUR	824	2	0	1.0	-0.4	1.1
62516	47.3	-15.2	ALL	P	SUR	964	1	0	0.9	-0.2	0.9
62518	40.8	-15.1	ALL	P	SUR	880	0	0	1.0	-0.1	1.0
62519	43.8	-11.8	ALL	P	SUR	683	1	0	1.2	0.5	1.3
62520	53.5	-20.1	ALL	P	SUR	214	0	0	1.1	0.5	1.2
62553	24.4	-26.1	ALL	P	SUR	140	0	0	0.6	-0.2	0.6
62572	40.1	-14.1	ALL	P	SUR	1	0	0	0.0	-1.6	1.6
62596	60.7	-32.3	ALL	P	SUR	1303	0	0	1.3	-0.2	1.3
62598	54.8	-23.3	ALL	P	SUR	81	0	0	2.0	-1.2	2.3
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	1.6	1.6
62705	54.9	-12.6	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
62707	50.1	-6.1	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
62709	57.0	0.0	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
62803	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	0.4	0.4
62807	50.1	-6.1	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
62829	48.7	-12.4	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
64549	64.1	-33.4	ALL	P	SUR	1537	80	5	2.3	-1.0	2.5
64550	63.8	-28.3	ALL	P	SUR	987	5	1	1.8	-0.7	2.0
64551	60.8	-26.3	ALL	P	SUR	142	0	0	2.6	-2.2	3.4
64845	59.1	-11.4	ALL	P	SUR	2	0	0	0.3	0.2	0.4
64846	60.7	-5.2	ALL	P	SUR	1	0	0	0.0	0.1	0.1
65516	62.9	-28.3	ALL	P	SUR	2280	9	0	1.3	-0.2	1.3
65581	59.0	-24.0	ALL	P	SUR	1427	13	1	1.4	-0.6	1.5
65595	59.5	-25.7	ALL	P	SUR	1320	11	1	1.3	-0.3	1.3
65601	62.5	-19.5	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
65602	61.9	-22.8	ALL	P	SUR	1663	23	1	1.6	-0.8	1.8
65662	60.8	-28.1	ALL	P	SUR	1478	16	1	1.3	-0.3	1.3

WIND SPEED

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
41523	32.2	-47.6	ALL	SPEED	SUR	7	0	0	2.9	-8.4	8.9
41552	20.8	-46.0	ALL	SPEED	SUR	621	2	0	2.7	0.4	2.7
41553	19.3	-62.8	ALL	SPEED	SUR	624	4	1	2.4	1.8	2.9
41554	21.3	-64.3	ALL	SPEED	SUR	621	1	0	2.3	0.6	2.4
41556	16.6	-60.6	ALL	SPEED	SUR	621	1	0	2.8	2.0	3.4
41557	20.4	-55.8	ALL	SPEED	SUR	629	3	0	1.9	0.2	1.9
41559	17.5	-55.9	ALL	SPEED	SUR	616	1	0	1.8	0.9	2.0
41560	14.3	-51.5	ALL	SPEED	SUR	579	2	0	2.6	0.7	2.7
41561	17.8	-53.7	ALL	SPEED	SUR	614	2	0	2.5	1.0	2.7
41563	14.1	-39.9	ALL	SPEED	SUR	591	0	0	1.5	-0.1	1.5
41645	30.0	-78.0	ALL	SPEED	SUR	624	1	0	2.8	1.2	3.1
41646	27.9	-77.9	ALL	SPEED	SUR	606	1	0	2.5	1.5	2.9
41647	24.2	-70.8	ALL	SPEED	SUR	609	0	0	2.5	1.3	2.8
41648	23.1	-73.2	ALL	SPEED	SUR	774	4	1	2.1	1.2	2.5
41650	22.6	-72.4	ALL	SPEED	SUR	616	0	0	2.0	0.3	2.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS

WIND SPEED

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
41651	24.3	-75.4	ALL	SPEED	SUR	116	0	0	2.3	-9.5	9.8
41652	29.3	-63.6	ALL	SPEED	SUR	783	6	1	2.7	0.8	2.8
44625	44.8	-55.7	ALL	SPEED	SUR	1	0	0	0.0	12.0	12.0
44740	43.7	-51.7	ALL	SPEED	SUR	1	0	0	0.0	0.8	0.8
44825	40.3	-73.2	ALL	SPEED	SUR	1	0	0	0.0	-3.4	3.4
62501	31.8	-19.4	ALL	SPEED	SUR	1	0	0	0.0	-4.0	4.0
62520	53.5	-20.1	ALL	SPEED	SUR	212	0	0	3.1	0.1	3.1
62553	24.4	-26.1	ALL	SPEED	SUR	406	0	0	1.4	-0.9	1.7
62572	40.1	-14.1	ALL	SPEED	SUR	346	0	0	1.1	0.2	1.1
62703	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	1.5	1.5
62705	54.9	-12.6	ALL	SPEED	SUR	1	0	0	0.0	-1.5	1.5
62707	50.1	-6.1	ALL	SPEED	SUR	2	0	0	0.2	0.9	0.9
62803	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	0.6	0.6
62807	50.1	-6.1	ALL	SPEED	SUR	1	0	0	0.0	-3.3	3.3
64845	59.1	-11.4	ALL	SPEED	SUR	2	1	50	0.0	1.3	1.3
64846	60.7	-5.2	ALL	SPEED	SUR	1	0	0	0.0	-1.1	1.1
65662	60.8	-28.1	ALL	SPEED	SUR	1	1	100			

WIND DIRECTION

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
41523	32.2	-47.6	ALL	DIRN.	SUR	2	0	0	0.1	-60.6	60.6
41552	20.8	-46.0	ALL	DIRN.	SUR	265	2	1	21.6	-4.2	22.0
41553	19.3	-62.8	ALL	DIRN.	SUR	269	4	1	15.4	2.9	15.7
41554	21.3	-64.3	ALL	DIRN.	SUR	485	1	0	19.5	-13.6	23.8
41556	16.6	-60.6	ALL	DIRN.	SUR	155	1	1	17.8	2.9	18.1
41557	20.4	-55.8	ALL	DIRN.	SUR	286	3	1	18.6	-10.1	21.1
41559	17.5	-55.9	ALL	DIRN.	SUR	130	1	1	20.1	-2.1	20.2
41560	14.3	-51.5	ALL	DIRN.	SUR	158	2	1	12.8	13.5	18.6
41561	17.8	-53.7	ALL	DIRN.	SUR	145	2	1	20.2	-7.3	21.5
41563	14.1	-39.9	ALL	DIRN.	SUR	288	0	0	14.4	12.6	19.1
41645	30.0	-78.0	ALL	DIRN.	SUR	383	1	0	15.5	7.4	17.2
41646	27.9	-77.9	ALL	DIRN.	SUR	380	1	0	13.2	-5.3	14.2
41647	24.2	-70.8	ALL	DIRN.	SUR	523	0	0	15.1	-1.4	15.2
41648	23.1	-73.2	ALL	DIRN.	SUR	635	4	1	15.9	24.2	29.0
41650	22.6	-72.4	ALL	DIRN.	SUR	482	0	0	15.3	-5.5	16.2
41651	24.3	-75.4	ALL	DIRN.	SUR	6	0	0	10.8	-1.8	10.9
41652	29.3	-63.6	ALL	DIRN.	SUR	581	6	1	15.8	-4.2	16.3
44625	44.8	-55.7	ALL	DIRN.	SUR	1	0	0	0.0	50.0	50.0
44740	43.7	-51.7	ALL	DIRN.	SUR	1	0	0	0.0	-1.3	1.3
62501	31.8	-19.4	ALL	DIRN.	SUR	1	0	0	0.0	-30.7	30.7
62520	53.5	-20.1	ALL	DIRN.	SUR	180	0	0	20.5	-36.6	42.0
62553	24.4	-26.1	ALL	DIRN.	SUR	313	0	0	12.5	-5.0	13.5
62572	40.1	-14.1	ALL	DIRN.	SUR	332	0	0	9.6	3.8	10.3
62703	49.9	-2.9	ALL	DIRN.	SUR	1	0	0	0.0	1.0	1.0
62705	54.9	-12.6	ALL	DIRN.	SUR	1	0	0	0.0	-20.8	20.8
62707	50.1	-6.1	ALL	DIRN.	SUR	1	0	0	0.0	9.5	9.5
62803	49.9	-2.9	ALL	DIRN.	SUR	1	0	0	0.0	-32.0	32.0
64845	59.1	-11.4	ALL	DIRN.	SUR	2	1	50	0.0	4.5	4.5
64846	60.7	-5.2	ALL	DIRN.	SUR	1	0	0	0.0	18.0	18.0
65662	60.8	-28.1	ALL	DIRN.	SUR	1	1	100			

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	1097	4	13	2.4	0.4	1082	0	5	0	7.6	1.0
AAR	21	0	0	1.4	-0.7	21	0	0	0	4.6	0.5
ACA	1339	0	4	1.5	-0.2	1357	0	4	0	6.5	0.6
AEA	204	1	3	1.7	0.2	205	0	4	0	7.4	1.7
AEL	315	0	10	1.6	-0.5	315	0	11	0	6.8	0.3
AEY	64	5	11	2.1	1.1	63	0	6	0	7.6	1.7
AFL	440	0	2	1.8	0.4	441	0	4	0	8.1	0.3
AFR	1004	1	6	1.7	0.1	1013	0	6	0	6.8	0.5
AIH	169	1	5	2.1	0.1	168	0	5	0	8.1	1.5
AJM	113	0	4	1.4	-0.3	111	1	5	0	6.6	2.2
AMM	65	0	8	1.1	-0.1	66	0	12	0	11.5	1.3
AMX	254	3	6	1.6	-0.1	254	0	4	0	9.2	1.2
AVA	21	0	5	1.9	-0.1	20	0	5	0	4.6	1.3
AVE	29	0	0	1.3	0.6	29	0	14	0	12.3	4.5
AZA	386	1	56	2.3	0.4	386	1	3	0	8.1	0.7
BAL	121	0	12	1.1	-0.3	123	0	15	0	7.9	0.7
BAW	485	0	7	1.9	-0.8	490	0	6	0	6.2	0.4
BLX	30	0	0	1.0	-0.2	30	0	0	0	5.3	0.5
BSK	21	14	24	1.9	-0.1	20	0	10	0	11.6	-0.6
BWA	56	2	4	2.0	1.6	56	0	4	0	6.1	0.4
CFC	61	0	13	2.4	0.1	62	0	18	0	8.0	1.6
CFG	496	0	3	1.6	-0.7	497	0	5	0	7.6	0.2
CLX	305	0	1	1.7	-0.8	307	0	1	0	6.4	0.7
COA	137	1	8	1.9	-0.4	136	0	11	0	9.0	1.3
CRL	286	0	4	1.7	0.6	291	0	4	0	6.9	0.7
CUB	139	0	1	1.8	1.1	138	0	4	0	8.5	0.4
DAL	870	0	15	1.7	-0.7	894	0	16	0	7.7	0.4
DCE	97	0	12	1.7	0.8	99	1	13	0	6.7	1.1
DLH	905	0	10	1.4	0.0	901	0	11	0	6.8	0.6
EDW	62	0	5	1.4	-0.3	61	2	7	0	5.4	1.2
EEZ	48	2	10	1.2	0.5	46	0	11	0	7.6	-0.2
EIA	131	0	7	1.7	-0.9	130	0	100	0	19.2	6.0
ELY	84	1	4	1.2	-0.2	86	0	5	0	6.8	1.1
ETH	29	3	7	1.0	0.0	28	0	4	0	6.3	1.9
EWW	61	0	2	1.2	0.0	61	0	2	0	5.7	0.9
FDX	445	1	39	1.5	0.3	459	0	39	0	8.3	1.0
FIN	296	0	3	1.6	0.0	293	0	5	0	8.0	0.9
GCO	54	2	9	1.7	0.3	54	0	100	0	17.0	-0.7
GRL	33	0	0	1.0	-0.2	33	0	0	0	5.4	-0.9
GTI	230	0	3	1.7	-0.4	227	0	4	0	7.5	0.6
IBE	1148	0	7	1.9	0.3	1137	0	7	0	7.2	1.4
ICE	776	0	3	1.6	-0.2	767	0	4	0	7.3	0.6
IWD	37	0	5	1.5	-0.5	38	0	5	0	5.4	-0.8
JKK	61	0	0	1.4	-0.1	52	0	4	0	8.6	1.5
JMC	52	2	8	1.6	0.5	51	0	6	0	5.0	1.3
KLM	1190	0	3	1.5	-0.2	1189	0	5	0	7.9	0.8
LDA	75	1	11	1.1	0.0	75	0	13	0	10.4	0.6
LDI	268	1	100	2.4	-0.3	264	0	5	0	6.7	1.0
LIB	477	2	9	1.5	0.5	483	0	10	0	7.8	1.0
LOT	108	0	5	2.1	-1.3	106	0	8	0	9.7	0.1
LTU	534	0	6	1.5	-0.3	533	0	6	0	7.5	1.0
MON	72	0	7	2.1	0.0	72	0	6	0	8.3	0.4
MPD	77	0	0	1.6	-0.3	76	0	4	0	9.5	1.3
MPH	492	0	1	1.8	-0.7	491	1	3	0	6.9	0.3
NCA	24	0	4	2.2	0.1	24	0	0	0	6.0	-0.2
NWA	2887	0	2	1.5	0.4	2901	0	2	0	6.7	0.7
PAC	114	1	5	2.0	0.2	118	0	3	0	6.9	0.3
RAM	27	0	7	1.8	-1.0	27	0	7	0	5.8	-0.2
RCH	218	1	100	1.8	0.3	220	1	100	0	12.7	3.0

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	N.REP.	PG	WIND PR	PC	RMS	BIAS
RRR	36	0	8	1.6	-0.3	37	0	11	0	6.7	-2.1
RZO	56	0	38	4.8	2.3	55	0	7	0	7.1	1.2
SHE	20	0	0	1.4	0.5	20	0	0	0	8.9	1.6
SLR	126	1	13	1.9	0.6	128	0	14	0	8.3	0.9
SVA	31	0	3	1.9	0.4	32	0	6	0	6.2	0.8
TAP	289	1	6	1.6	-0.2	284	0	8	0	8.7	0.9
TPA	25	0	0	0.9	0.3	25	0	0	0	5.8	0.3
TSC	37	0	0	2.0	0.1	35	0	0	0	6.3	1.0
UAL	299	0	100	1.9	-0.9	312	0	100	0	6.4	0.8
UPS	762	0	41	1.4	0.0	765	0	41	0	7.9	0.6
USA	191	0	3	1.6	-0.2	154	0	4	0	7.0	1.6
VIR	317	1	3	1.5	-0.1	323	0	3	0	7.2	1.2
VKG	28	0	7	2.8	-0.6	28	0	0	0	5.1	0.9
VPB	36	3	3	1.9	1.1	36	0	0	0	4.7	1.3
WOA	38	0	5	1.6	0.6	38	3	11	0	8.8	1.3
EU	18401	0	28	1.3	0.2	18401	0	25	0	4.6	0.4
KL	827	0	8	1.3	0.9	824	0	8	0	5.0	0.8
LH	466	0	6	1.5	0.9	465	0	5	0	4.8	0.8
TN	52	0	12	2.1	0.8	52	0	17	0	13.6	1.2
N	255	2	5	2.2	0.3	261	0	2	0	7.4	0.3
US ACARS	16049	15	36	1.3	0.2	16049	0	22	0	5.1	0.5

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP5	12	Z	100	1	0	0.0	44.0	44.0
ELML7	00	Z	100	24	0	13.2	25.5	21.8
ELML7	12	Z	100	16	0	16.8	41.1	37.6
FNOR	00	Z	100	10	0	12.1	27.1	24.3
FNOR	12	Z	100	12	0	12.8	24.2	20.5
FNOU	00	Z	100	10	0	15.7	45.6	42.8
FNOU	12	Z	100	10	0	13.3	52.8	51.1
FNPH	00	Z	100	10	0	14.7	31.1	27.4
FNPH	12	Z	100	9	0	5.6	17.9	17.0
FNRS	00	Z	100	6	0	5.8	16.5	15.5
FNRS	12	Z	100	8	0	19.0	19.0	0.1
LDWR	00	Z	100	29	0	18.3	24.5	-16.3
LDWR	12	Z	100	30	0	15.4	22.0	-15.7
OVYA2	00	Z	100	4	0	12.6	25.1	-21.8
OVYA2	12	Z	100	4	0	37.7	50.8	-34.0
OXYH2	00	Z	100	3	0	5.9	27.3	-26.7
OXYH2	12	Z	100	3	0	17.7	25.2	-18.0
SWJS	00	Z	100	1	0	0.0	24.0	24.0
SWJS	12	Z	100	2	0	14.0	23.6	19.0
V2XO	00	Z	100	1	0	0.0	10.0	-10.0
WPKD	00	Z	100	5	0	17.6	25.0	17.8
WPKD	12	Z	100	6	2	20.9	22.2	7.5
ZCBP6	00	Z	100	5	0	6.9	22.3	21.2
ZCBP6	12	Z	100	6	0	45.3	49.5	20.0
03953	00	Z	100	30	0	8.8	21.5	19.6
03953	12	Z	100	31	0	12.4	29.3	26.6
04018	00	Z	100	30	0	10.0	10.0	0.8
04018	12	Z	100	30	0	16.8	16.9	1.3
04220	00	Z	100	24	0	12.1	13.5	-6.0
04220	12	Z	100	25	0	10.9	13.9	-8.6
04270	00	Z	100	21	0	12.4	16.2	-10.5
04270	12	Z	100	26	0	13.4	18.6	-13.0
04339	00	Z	100	22	1	13.2	16.3	-9.7
04339	12	Z	100	23	0	16.0	19.1	-10.3
04360	00	Z	100	25	0	13.3	20.4	-15.4
04360	12	Z	100	24	0	13.0	21.6	-17.2
08001	00	Z	100	25	0	22.3	23.1	-6.1
08001	12	Z	100	27	0	21.4	21.5	2.0
08508	00	Z	100	27	0	17.6	20.0	9.6
08508	12	Z	100	28	0	21.1	29.8	21.0
08522	00	Z	100	30	0	8.5	18.5	16.5
08522	12	Z	100	30	0	11.0	22.6	19.8
08594	12	Z	100	18	0	25.3	54.0	47.7
60020	00	Z	100	29	0	16.1	29.8	25.1
60020	12	Z	100	29	0	22.0	33.4	25.1
71600	00	Z	100	30	0	13.0	14.9	-7.2
71600	12	Z	100	31	0	16.3	16.3	-1.5
72201	00	Z	100	29	0	14.9	37.0	33.9
72201	12	Z	100	29	0	10.1	27.1	25.1
72402	00	Z	100	30	0	13.2	35.7	33.2
72402	12	Z	100	29	0	18.8	28.5	21.4
74494	00	Z	100	28	0	12.5	14.1	6.5
74494	12	Z	100	28	0	11.2	14.4	-9.0
78016	12	Z	100	28	0	14.3	38.1	35.3

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP5	12	Z	500	1	0	0.0	29.0	29.0
ELML7	00	Z	500	25	0	7.0	7.3	2.1
ELML7	12	Z	500	17	0	8.5	10.2	5.5
FNOR	00	Z	500	12	0	13.3	13.9	3.8
FNOR	12	Z	500	13	0	17.3	18.3	6.2
FNOU	00	Z	500	10	0	5.3	15.6	14.7
FNOU	12	Z	500	11	0	8.1	14.9	12.5
FNPH	00	Z	500	10	0	5.6	7.0	4.2
FNPH	12	Z	500	10	0	9.2	9.6	2.9
FNRS	00	Z	500	8	0	30.5	32.7	-11.6
FNRS	12	Z	500	10	0	14.1	14.9	-4.9
LDWR	00	Z	500	29	0	11.0	11.0	-1.0
LDWR	12	Z	500	30	0	13.2	13.4	-2.6
OVYA2	00	Z	500	4	0	6.0	7.2	-4.0
OVYA2	12	Z	500	5	0	19.0	24.5	-15.4
OXYH2	00	Z	500	4	0	9.4	10.2	-4.0
OXYH2	12	Z	500	3	0	16.6	17.3	5.0
SWJS	00	Z	500	1	0	0.0	7.0	7.0
SWJS	12	Z	500	4	0	6.8	12.7	10.8
V2XO	00	Z	500	1	0	0.0	6.0	-6.0
WPKD	00	Z	500	5	0	21.5	25.8	-14.2
WPKD	12	Z	500	6	2	15.4	16.2	5.0
ZCBP6	00	Z	500	5	0	13.3	21.4	16.8
ZCBP6	12	Z	500	7	0	17.2	19.8	9.7
03953	00	Z	500	30	0	7.8	12.7	10.0
03953	12	Z	500	31	0	9.4	18.0	15.3
04018	00	Z	500	30	0	10.3	11.1	4.1
04018	12	Z	500	31	0	8.3	9.7	5.1
04220	00	Z	500	24	0	7.9	8.4	2.6
04220	12	Z	500	25	0	7.8	8.2	2.4
04270	00	Z	500	22	0	12.1	12.2	1.9
04270	12	Z	500	27	0	12.2	13.2	5.0
04339	00	Z	500	22	1	10.7	10.9	2.5
04339	12	Z	500	24	0	7.7	7.7	0.3
04360	00	Z	500	25	0	8.8	8.8	-0.4
04360	12	Z	500	24	0	9.9	10.1	-2.0
08001	00	Z	500	29	0	11.7	11.7	-0.8
08001	12	Z	500	30	0	10.3	12.4	6.9
08508	00	Z	500	28	0	6.4	8.3	-5.3
08508	12	Z	500	28	0	14.7	14.9	2.1
08522	00	Z	500	30	0	9.6	12.2	7.5
08522	12	Z	500	31	0	8.1	14.7	12.4
08594	12	Z	500	26	0	10.1	11.2	4.9
60020	00	Z	500	29	0	9.4	12.6	8.3
60020	12	Z	500	30	0	9.1	15.3	12.3
71600	00	Z	500	30	0	10.4	12.1	-6.2
71600	12	Z	500	31	0	10.1	11.6	-5.7
72201	00	Z	500	29	0	5.8	6.8	3.6
72201	12	Z	500	30	0	5.5	5.5	-0.3
72402	00	Z	500	30	0	7.4	9.3	5.7
72402	12	Z	500	29	0	9.5	9.5	0.2
74494	00	Z	500	28	0	9.3	9.3	0.9
74494	12	Z	500	31	0	7.0	7.2	-1.6
78016	12	Z	500	29	0	7.8	10.5	7.1

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP5	12	V	100	1	0	0	9.7	4.2	-8.7
ELML7	00	V	100	23	0	0	4.8	-0.5	0.3
ELML7	12	V	100	15	0	0	4.1	0.7	-0.2
FNOR	00	V	100	11	0	0	3.7	0.7	1.1
FNOR	12	V	100	11	0	0	4.3	0.8	0.8
FNOU	00	V	100	7	0	0	4.7	2.4	0.3
FNOU	12	V	100	7	0	14	7.8	-0.4	0.9
FNPH	00	V	100	8	0	0	3.8	-0.2	-2.1
FNPH	12	V	100	9	0	0	3.5	-0.3	1.2
FNRS	00	V	100	6	0	0	3.8	0.1	1.3
FNRS	12	V	100	7	0	0	4.8	0.2	0.9
LDWR	00	V	100	29	0	0	3.6	-0.7	-1.5
LDWR	12	V	100	30	0	0	3.8	0.0	-0.8
OVYA2	00	V	100	3	0	0	2.8	-1.1	0.8
OVYA2	12	V	100	2	0	0	4.4	2.1	2.5
OXYH2	00	V	100	3	0	0	3.0	1.2	0.6
OXYH2	12	V	100	3	0	0	5.8	-0.5	-3.6
SWJS	00	V	100	1	0	0	4.0	3.8	1.2
SWJS	12	V	100	2	0	0	6.8	-2.1	-2.5
V2XO	00	V	100	1	0	0	1.0	0.9	-0.4
WPKD	00	V	100	5	0	20	13.9	-5.6	0.9
WPKD	12	V	100	7	0	0	5.8	-0.6	2.3
ZCBP6	00	V	100	5	0	0	3.7	1.1	0.1
ZCBP6	12	V	100	4	0	0	2.9	0.5	-0.2
03953	00	V	100	30	0	0	4.2	1.2	1.5
03953	12	V	100	31	0	0	3.4	-0.2	0.9
04018	00	V	100	29	0	0	4.0	0.5	-0.2
04018	12	V	100	30	0	0	3.9	0.5	0.3
04220	00	V	100	24	0	0	4.3	0.1	0.5
04220	12	V	100	24	0	0	3.7	0.2	-1.0
04270	00	V	100	21	0	0	2.8	0.3	0.1
04270	12	V	100	26	0	0	4.4	-0.4	0.7
04339	00	V	100	20	0	0	5.9	0.6	-0.7
04339	12	V	100	23	0	0	5.7	2.3	-0.1
04360	00	V	100	24	0	0	4.7	-0.1	0.3
04360	12	V	100	24	0	0	5.0	0.2	-0.7
08001	00	V	100	22	0	0	4.3	1.6	1.0
08001	12	V	100	22	0	0	3.8	0.3	0.5
08508	00	V	100	13	0	0	3.9	0.4	0.5
08508	12	V	100	16	0	0	5.0	-0.2	0.7
08522	00	V	100	25	0	0	5.0	1.7	-0.7
08522	12	V	100	29	0	0	6.1	0.3	1.5
08594	12	V	100	18	0	66	5.2	1.1	2.8
60020	00	V	100	27	0	0	5.9	1.3	0.1
60020	12	V	100	29	0	0	5.0	0.3	1.4
71600	00	V	100	28	0	0	5.4	1.0	1.1
71600	12	V	100	30	0	0	5.9	0.5	-0.4
72201	00	V	100	29	0	0	3.9	0.6	-0.2
72201	12	V	100	29	0	0	3.8	-0.4	-0.2
72402	00	V	100	29	0	0	5.7	0.9	-0.7
72402	12	V	100	27	0	0	4.4	1.0	-1.7
74494	00	V	100	26	0	0	4.5	-0.7	0.5
74494	12	V	100	27	0	0	4.0	-0.4	-0.5
78016	12	V	100	28	0	0	6.0	0.2	0.7

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP5	12	V	500	1	0	0	1.7	-0.9	1.5
ELML7	00	V	500	23	0	0	3.9	1.4	-0.2
ELML7	12	V	500	16	0	0	4.0	-0.2	1.3
FNOR	00	V	500	12	0	0	6.2	0.6	-1.4
FNOR	12	V	500	12	0	0	4.5	0.5	0.2
FNOU	00	V	500	6	0	0	2.5	-1.7	0.8
FNOU	12	V	500	8	0	0	3.5	0.5	-0.4
FNPH	00	V	500	9	0	0	4.9	-0.2	2.4
FNPH	12	V	500	10	0	0	4.3	1.4	0.1
FNRS	00	V	500	7	0	0	4.3	0.8	2.9
FNRS	12	V	500	6	0	0	3.3	0.8	0.6
LDWR	00	V	500	29	0	0	3.8	0.6	-0.2
LDWR	12	V	500	30	0	0	4.1	0.4	0.2
OVYA2	00	V	500	3	0	0	3.4	1.6	-1.1
OVYA2	12	V	500	5	0	0	6.4	4.7	-1.1
OXYH2	00	V	500	4	0	0	2.1	0.6	1.5
OXYH2	12	V	500	3	0	0	4.0	1.4	-0.8
SWJS	00	V	500	1	0	0	1.7	0.8	1.5
SWJS	12	V	500	4	0	0	4.3	-1.4	1.1
V2XO	00	V	500	1	0	0	1.6	-0.2	-1.6
WPKD	00	V	500	4	1	0	3.2	0.0	-1.1
WPKD	12	V	500	8	0	0	4.5	2.2	1.2
ZCBP6	00	V	500	5	0	0	5.8	1.9	-3.5
ZCBP6	12	V	500	5	0	0	3.6	0.4	-0.4
03953	00	V	500	30	0	0	3.7	0.2	-0.5
03953	12	V	500	31	0	0	3.6	0.5	0.1
04018	00	V	500	30	0	0	3.8	0.8	0.9
04018	12	V	500	31	0	0	4.6	0.2	-0.8
04220	00	V	500	24	0	0	4.3	0.8	-1.4
04220	12	V	500	25	0	0	4.6	1.5	-0.6
04270	00	V	500	22	0	0	5.6	0.7	-1.7
04270	12	V	500	26	0	0	4.7	-0.5	-0.5
04339	00	V	500	22	0	4	6.6	1.4	0.1
04339	12	V	500	23	0	0	5.1	1.0	-1.0
04360	00	V	500	25	0	0	5.5	-1.0	0.4
04360	12	V	500	24	0	0	5.6	-1.3	0.0
08001	00	V	500	29	0	0	4.8	0.0	-0.8
08001	12	V	500	28	0	0	4.0	0.5	0.1
08508	00	V	500	17	0	0	5.6	0.1	0.3
08508	12	V	500	16	0	0	4.0	-0.4	0.2
08522	00	V	500	29	0	0	3.6	0.8	-0.1
08522	12	V	500	29	0	0	4.4	0.4	0.6
08594	12	V	500	24	1	62	4.9	-0.4	1.8
60020	00	V	500	27	0	0	5.7	-1.1	0.8
60020	12	V	500	29	0	0	4.6	0.7	0.5
71600	00	V	500	30	0	0	5.2	0.0	0.6
71600	12	V	500	31	0	0	3.8	-0.2	0.3
72201	00	V	500	29	0	0	2.6	-0.2	-0.6
72201	12	V	500	30	0	0	2.8	-0.2	-0.5
72402	00	V	500	30	0	0	3.7	0.6	-0.7
72402	12	V	500	29	0	0	3.3	0.5	0.1
74494	00	V	500	28	0	0	3.7	-0.8	-0.7
74494	12	V	500	31	0	0	4.1	-1.0	1.4
78016	12	V	500	29	0	0	3.7	0.6	1.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45